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ABSTRACT

This document consists of a complete run of "SET" from 1992 through 1996 inclusive (10 issues). Each SET issue consists of a packet of brief reports, leaflets, pamphlets, etc., all reporting on educational research and designed for private study, staff-meetings, in-service courses, or small group discussions. (LL/ND)

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RESEARCH INFORMATION FOR TEACHERS

NUMBER ONE 1992

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set research information for teachers

number one 1992

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Produced twice-yearly by the Australian and New Zealand Councils for Educational Research.

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Contents

1. **Contents Sheet**
   Circulate a copy or pin one on the noticeboard.

2. **Appraising Teachers**
   Wayne Edwards
   When we asked which topic subscribers would most like to see research about, appraisal topped the list. This article looks at (a) appraisal for **firing** - helps administrators only, and (b) appraisal for **fixing** - helps the teacher and the school.

3. **How to Single Out a School**
   Barry Bastow
   Parents do look round for the 'best' school for their children. Can a school change itself to be the 'best'? The options for change are limited, and advertising your wares may be more like selling soap than knowledge.

4. **Success is Not Enough**
   Annette Karmiloff-Smith
   Contrasting the way chimps and young children learn gives an insight into a stage, most noticeable about the time children start school, when earlier 'success' is followed by 'failure' at the same tasks. When success comes again, it is a huge jump ahead of the best a chimpanzee can manage. Junior school maths, physics and language examples are explained.

5. **In the Company of Authors**
   Frank Smith
   New Zealanders, self-satisfied, pat themselves on the back for their excellent teaching of reading. One of the long-time reading gurus, Frank Smith, has written this thoughtful, if opinionated, account of how continued success can be achieved.

6. **Thx rxxl bxxks dxbxtx xs pxxntlxss**
   Peter Donnelly
   A letter to the editor of the *Times Educational Supplement*. Donnelly makes a point in the debate about 'real books' and 'phonics' in a dramatic way.

7. **Reading But Not Understanding**
   Susan Dymock
   There are a small number of children who can sound out every word and make it all sound sensible, but who understand very little of what they have 'read'. Theoretical conclusions and help for teachers.

8. **Titular Colonicity and Scholarship Revisited: Research and Scholarly Impact**
   Michael Townsend
   Some titles have colons in them, some don't. Is there something in this? Do colons point to better articles? Better research? Is this a subject worth studying? Shock! Horror! Pomposity probes pomposity!

9. **Memorable Text**
   Michael Graves and Wayne Slater
   Some textbooks are dreadfully dull. Researchers tried out the same facts written by different authors and discovered that the way in which the facts are written makes a big difference to how much is remembered.

10. **Fact + Fiction = Faction**
    Roy Twitchin
    Television nowadays often blends the ingredients of different genres into one programme, notably documentary (fact) and drama (fiction). Research in Britain confirms that children have difficulty in separating 'fact' from 'opinion' in such programmes. Faction cannot be dis-invented, so teachers have a job on their hands.

11. **'Our Teachers Never Come Back After Christmas.'**
    Alan Watson
    Quite small children recognise the problem some schools have in keeping staff. What makes for a satisfied, stable, teaching force? What can principals and administrators do?

12. **Senior Secondary School Courses**
    Margaret Batten
    New subjects and courses to interest and benefit senior secondary students who do not plan to go on to higher education have been introduced. This research studied two different courses which provide diversity, involvement and success.

13. **From School to Work in Japan**
    Kaori Okano
    Transition from school to work is pretty haphazard in Australia and New Zealand; in Japan it is highly organised. We have young people unemployed, exams of doubtful *educational* worth, and a system of entry into tertiary study that is hardly fair to minorities. So it is worthwhile examining a very different system.

14. **A Great Waste of Talent**
    David Hughes and Hugh Lauder
    Careful analysis of where school leavers go reveals that many who have the ability to benefit from a university education do not get one. They are mainly children from lower-class backgrounds. Recent government policies are likely to make the situation worse.

15. **Poverty and Performance**
    Christine Wilson and Ann Dupuis
    Children from homes with little money do not always fail, but it is usual! This careful study of three groups of high school pupils and their families compares and contrasts incomes, circumstances, lives, aspirations, and successes; and the ways poverty and performance are linked become much clearer.

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number one 1992

APPRAISING TEACHERS

Is There Light Without Heat?

Wayne Edwards
Massey University

Two broad types of appraisal

WE ALL HAVE STORIES to tell about being appraised. Some are amusing, some horrific. However, they usually result from our experience of one or other of two broad approaches to appraisal. These can be simply termed *firing* and *fixing*.

Firing

Let us take firing first (the more usual term is *summative* appraisal). It involves end-point judgements, to sum up opinions and judgements, and the result could be dismissal. Summative appraisal is used:

- to determine competence (the most common purpose)
- to place people on pay scales or points on career ladders
- to confirm appointments (or take them away!)
- to address complaints.

Summative appraisal is not necessarily about helping people to get better! More often, it has to do with management decisions. Yet, as we all know, when anyone tries to judge the performance of skills and the effectiveness of outputs in education, they are immediately on contestable ground. I know what makes a good teacher, *so do you*. But do we agree? Teaching is a very complex process and what makes good teaching is not easy to determine. Quality of teaching is the product of many external factors; outcomes are difficult to determine, they are long term and cumulative and are influenced by many factors other than teaching practices.

Fixing

Appraisal as fixing (more commonly termed *formative* appraisal) is simply constructive, professional discussion aimed to improve the performance of the individual and the organisation. Formative appraisal:

- is not a one-sided discussion
- is reflective and based on evidence
- is a planned process
- is aimed at goal setting, review of performance and enhancement of professional growth (and, therefore, has a clear orientation towards improvement)
- values self-appraisal as an important component of the process as it includes examining one's own performance as part of any appraisal cycle, system or framework.

Formative appraisal, then, is about helping people to improve and enhance their skills. It is about self-development and organisational improvement and effectiveness.

The dilemma of the two approaches

There are two instant, interlocked problems when we talk about summative and formative appraisal in the same breath. They can be summed up in two questions:

1. Who is actually doing the appraisal?

Most of us are likely to find difficulty with the same person doing both types of assessment of our work. We see tensions between the two approaches. When receiving a formative appraisal we may open up and share our hopes, our aspirations and our inadequacies with someone who can help us. Yet quite often the person appraising our work also has power over our career and life chances. It's really an issue of trust. Popham sums up the point cogently:

> A few principals will vigorously argue that they have been able to establish such an 'atmosphere of trust' with their teachers that the teachers are able to respond honestly in a formative setting even though they know that the principal carries summative clout. Such well-intentioned principals should be encouraged to try their water-walking skills on a local lake. It appears they can function at levels of competence not available to mere mortals.

2. What is the purpose of the appraisal?

You can have both types of appraisal operating in an institution. For instance, teachers and principal together can seek to improve a teacher's performance during the year using formative appraisal techniques. But it is summative appraisal which comes into play when the teacher applies for a more senior position in the school. There is difficulty in linking both types of appraisal: Popham describes this as a 'dysfunctional marriage'.

> The reason that formative and summative teacher evaluation cannot cavort together congenially is that their end-results are so dramatically different. The decisions riding on formative teacher evaluation involve a host of choices focused on, 'How can I do better?'.... Summative teacher evaluation, in contrast, can lead to identification of weak teachers who may, if unremediable, be dismissed. In essence, the distinction is between 'fixing' and 'firing'.... A key shortcoming, then, with today's teacher evaluation practice is that its summative function contaminates its formative function, and vice versa.

A way of addressing some key issues

Appraisal is the formalised opportunity to address some important key issues - each of which generates a battery of questions for the principal or head-of-department or supervisor or manager or leader.

- The job which a person is doing - its nature and content: 'What does this person's job involve and how is he or she doing it?'
- The co-ordination of people and activities: 'How does this person fit into the total organisation? How can the organisation best benefit from his or her contribution?'
- The extent of appropriate autonomy: 'How much freedom can be given? How well is it handled?'
- The goals planned and sought: 'Are this person's goals realistic? Are they being achieved? Where are we going in this organisation?'
- The extent of appropriate delegation: 'What tasks can be given to this person? Which ones need to be taken away?'
- The feedback which should be provided: 'What information should this person be getting? What is the best way of doing this?'
- The need for professional development: 'What opportunities or assistance would help this person to be better at the job?'

Put very simply, these issues are embodied in three questions: 'Where have you been? Where are you going? How will you know when you get there?'

What does research say?

Research literature (books, reports, articles in journals and papers from conferences) does not abound in descriptions of appraisal systems which have produced better teaching and learning. There being no clear evidence from research that appraisal produces better teaching and learning, the reasons for having appraisal systems seem to be based more on a confidence that the process is logical. But the literature contains ready support for one clear result which comes when you introduce formal appraisal systems — improved communication.

> 'One of the major benefits claimed for appraisal is that it can improve vertical communication within organisations....' OECD

Lowe noted other benefits as well when appraisal was used in a group of English and Welsh schools:

- Greater confidence and morale
- Better professional relations and communications
- Better planning and delivery of the curriculum
- Wider participation and better targeting of inservice training
- Better career planning.

Boulter, an English Director of Education who reported on his study of appraisal systems in California and Colorado, provided a series of points for thought, too:

- There was general agreement that *appraisal had not increased the dismissal rate of ineffective teachers* but it was useful in counselling ineffective teachers out of teaching.
- Although, in fact, Boulter advised that appraisal for growth should *not* be linked with dismissal procedures, he was similarly strong that *it shouldn't be linked with pay fixing*. (The danger of confused purpose was discussed earlier, but needs constant attention.)
- *The quality of the principal*, Boulter noted, is crucial in determining the success of the appraisal process. The qualities needed are knowledge of (and backing for) the process, skill in relating to other people, and ability to help people to grow professionally.
- Appraisal was reported to be acceptable when it was made available to *everyone* at *all levels* of the system.
- It is important that an appraisal system is *developmental* (i.e., helps people to grow) and is characterised by *ownership by the participants* (i.e., it is at least understood; but, better still, is generated, from the 'bottom up').
- It is important, too, that *appraisers are suitably trained* and prepared for their task.

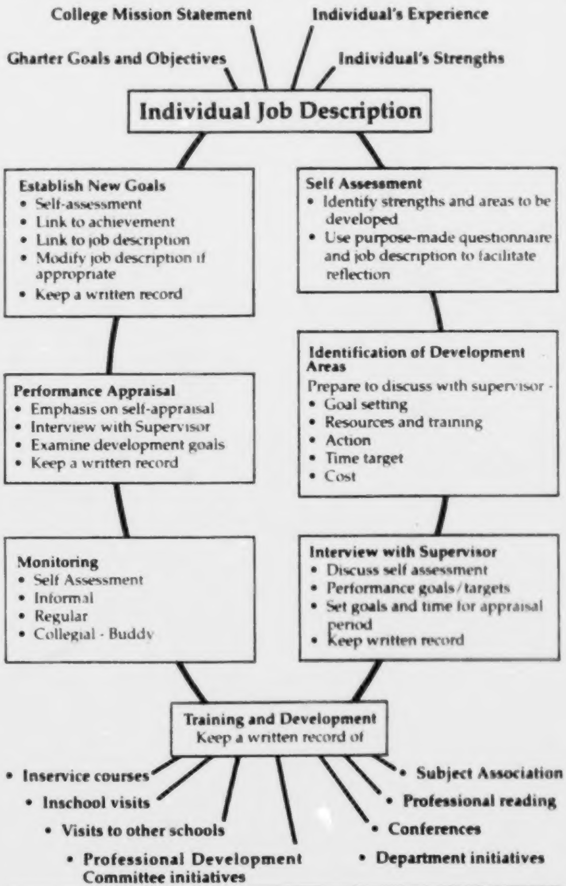
The OECD report notes further benefits, too:

- Appraisal has a role in clarifying accountability, providing feedback, and increasing efficiency and effectiveness.
- Appraisal has a role in introducing new standards and attitudes.
- Appraisal has value in linking the individual and the organisation (i.e., co-ordinating tasks, aspirations, roles, and goals).
- Appraisal encourages the link between the needs-assessment function of appraisal and knowledge and skill development in relation to training and development.

This last point can be briefly illustrated by drawing on some recent ideas from two New Zealand teachers and graduate students, Margaret McLeod and Elizabeth Rogerson, who drew up the two charts below. The charts

Chart 1

A Model for Development and Appraisal for Professional Development and Career Planning of Staff at ....


College Mission Statement
Individual's Experience
Charter Goals and Objectives
Individual's Strengths
Individual Job Description
Establish New Goals
• Self-assessment
• Link to achievement
• Link to job description
• Modify job description if appropriate
• Keep a written record
Self Assessment
• Identify strengths and areas to be developed
• Use purpose-made questionnaire and job description to facilitate reflection
Performance Appraisal
• Emphasis on self-appraisal
• Interview with Supervisor
• Examine development goals
• Keep a written record
Identification of Development Areas
Prepare to discuss with supervisor -
• Goal setting
• Resources and training
• Action
• Time target
• Cost
Monitoring
• Self Assessment
• Informal
• Regular
• Collegial - Buddy
Interview with Supervisor
• Discuss self assessment
• Performance goals/targets
• Set goals and time for appraisal period
• Keep written record
Training and Development
Keep a written record of
• Inservice courses
• Inschool visits
• Visits to other schools
• Professional Development Committee initiatives
• Subject Association
• Professional reading
• Conferences
• Department initiatives

Margaret McLeod, Massey University, 1991 stress the important professional-development aspect of appraisal. *Chart 1* makes the point that many important aspects are inter-related: mission and goals, monitoring, self-assessment, interviews, training and development, and appraisal. *Chart 2* illustrates effectively the link between appraisal and a possible 'menu' of professional-development opportunities. (It also emphasises a school's climate and the overarching values of instructional leadership and student learning.)

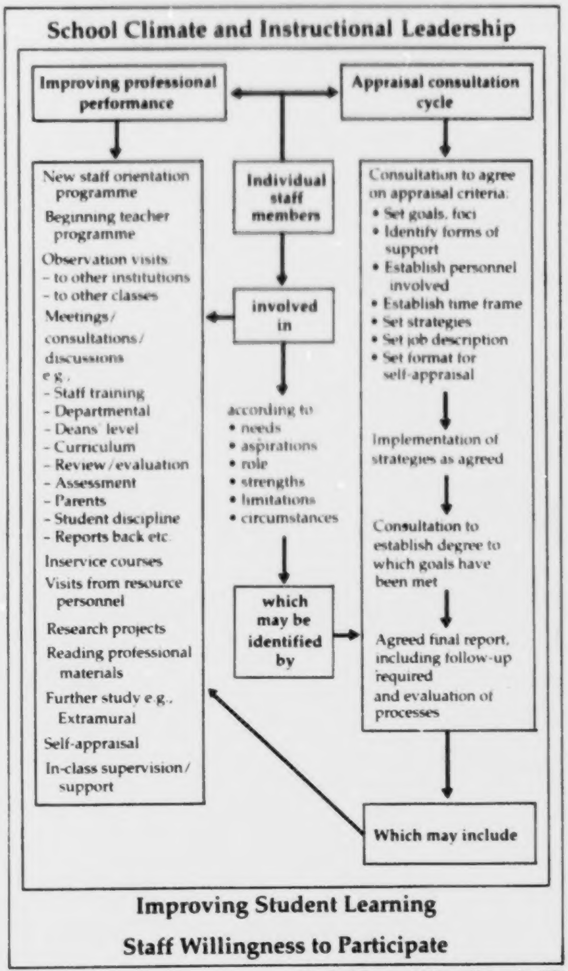
What are the drawbacks with appraisal?

It is important to consider, too, the difficulties which are likely to impinge when you try to implement any appraisal system. The following points - although only summarised here - are well worth careful consideration and discussion when appraisal processes are being planned or reviewed.

- The difficulties of measuring management and leadership abilities and outputs in education.
- The biases which we might bring to the task of appraisal - and the influence of politics and personalities.
- The difficulty of meaningfully applying rating standards - we often tend to take the easy middle road.
- The considerable resource costs of time, in particular, and money involved in properly supporting appraisal programmes.
- The difficulties of getting busy senior-level people to do justice to the appraisal process - by being suitably prepared and setting aside time for it.
- The (already discussed) dilemma of mixing issues of performance and rewards. There is also the related difficulty of ensuring that parties do not have conflicting objectives when participating in the process.
- The suspicion or scepticism which some people might bring to the appraisal process - about its motives or usefulness.
- The influence of the organisation's culture — which will determine whether or not any particular process will be acceptable to its members and will be 'in tune' with the organisation's values and the way in which things are normally done in the organisation.

Chart 2

Framework for Improving Professional Performance


School Climate and Instructional Leadership
Improving professional performance
Appraisal consultation cycle
New staff orientation programme
Beginning teacher programme
Observation visits
- to other institutions
- to other classes
Meetings/consultations/discussions
e.g.,
- Staff training
- Departmental
- Deans' level
- Curriculum
- Review/evaluation
- Assessment
- Parents
- Student discipline
- Reports back etc.
Inservice courses
Visits from resource personnel
Research projects
Reading professional materials
Further study e.g., Extramural
Self-appraisal
In-class supervision/support
Individual staff members
involved in
according to
• needs
• aspirations
• role
• strengths
• limitations
• circumstances
which may be identified by
Consultation to agree on appraisal criteria:
• Set goals, foci
• Identify forms of support
• Establish personnel involved
• Establish time frame
• Set strategies
• Set job description
• Set format for self-appraisal
Implementation of strategies as agreed
Consultation to establish degree to which goals have been met
Agreed final report, including follow-up required and evaluation of processes
Which may include
Improving Student Learning
Staff Willingness to Participate

Elizabeth Rogerson, Massey University, 1991

These drawbacks are concerned less with the technicalities of appraisal and more with the key question, 'Whose interests are being served?' This question implies the necessity for careful consideration of a number of critical ethical issues when appraisal is contemplated. A useful article by Retallick addresses the same question, as he reviews teacher-supervision and development processes. His article is sobering in the moral and ethical questions which it raises in the mind: Who owns the data produced in appraisal? Who will have access to the data? How will the data be used? Is the appraisal process one of manipulation or domination? On the other hand, we face other questions, too. Can appraisal be used to 'free' and develop people? Can it be used in an educational place to promote what Retallick calls a community of 'critical inquirers'?

What might a good appraisal system look like?

This is the $64,000 question! Put another way, it asks, 'What criteria might indicate that a system is worthwhile?' Here is my vote!

First, *participants understand it* - and will value it, want it and be committed to it.

Second, *the procedures are realistic* - they are open, they are known and considered worthwhile, they are not unnecessarily time consuming, time wasting or time serving.

Third, *the procedures are kept under review* - they are not immovably set in concrete for all time!

Fourth, *the data are confidential to the particular participants* - a crucial point mentioned earlier.

Fifth, *self-assessment and professional development are promoted* - needs and opportunities are identified and the system celebrates past growth and promotes future growth.

Sixth, *the system uses accurate and valid data* - not hearsay, biased opinions or gossip.

Seventh, *the system produces a broad and accurate picture*.

Eighth, *the system does good* - not harm! It is purposeful, non-threatening, supportive, developmental, cyclical and it enhances teaching and learning.

Ninth, *the system is just* - people are trained and prepared for it, appropriate growth opportunities are actually available, people have equal opportunities and are treated fairly.

The *Appendix* contains an alternative battery of points from Kemp and Nathan which can be compared with the list above (and the one which will be emerging in your own mind!).

Conclusion

I believe that people in leadership positions have a responsibility to help their colleagues to 'grow' professionally - to improve them, to empower them. Professional dialogue between the leaders and those led (i.e., between supervisor and staff, principal or HOD and staff) ought to be continuous. Then, people share knowledge, and receive feedback regularly. In such cases, formal appraisal, interviews and reports are simply affirmations of shared knowledge. One's professional growth and development is vitally important but professional growth without appraisal can only be accidental. Appraisal, therefore, should be illuminating and growth producing... without threat or danger or intrigue. As the subtitle of this paper noted, an effective system of appraisal should be capable of *producing light without heat*!

Notes

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An earlier version of this article was presented as the keynote address to the Teachers' Refresher Course Committee's *Staff and School Appraisal* Course, Wellington, September 1991.

Books etc., mentioned; and further reading

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Appendix

What are the advantages of appraisal?

A well thought out and well managed system of appraisal can bring substantial benefits to both individual team members and the team as a whole.

Individual team members

A good appraisal system:

- offers each individual an opportunity to share in discussion of team aims, tasks and priorities
- clarifies for each individual how her/his job fits in with the overall team task
- provides an opportunity for a review of priorities and performance
- helps in identification, and recognition, of strengths and areas of success
- helps in identification of areas of weakness and provides practical help in overcoming them
- identifies training needs and how they can best be met
- provides the opportunity for individuals to discuss career development
- enhances the individual's job satisfaction.

The team as a whole

Appraisal:

- helps to develop a shared understanding of the team aims, tasks and priorities
- clarifies how individuals' jobs fit in with the overall team task
- reviews team priorities and performance
- provides opportunity to modify team organisation to meet changing needs and priorities
- improves communication and interchange of ideas within the team
- helps to identify potential within the team and encourages its development
- helps to motivate team members and enhance team performance
- identifies team training needs and how they can best be met
- helps to build the team into a more coherent unit, and to enhance the job satisfaction of team members.

From: Kemp and Nathan (1989) pp.200-201.

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How To Single Out a School

Barry Bastow

Ministry of Education
Western Australia

ONE OF THE MOST FREQUENT REASONS politicians offer for the introduction of parental choice of schools is that it will lead to better school performance. This is usually linked to better exam results. However, the economic rationale for choice and my recent research study into parental choice of secondary schools strongly suggest that the politicians' rhetoric is wrong.

Collecting the facts

My research involved collecting data from parents of children in their last few years of primary school in the United Kingdom. They were asked to complete a questionnaire about the secondary school that they preferred for their child and about their views on many aspects of schools and education.

Some of the questions had a limited number of answers, while others were open and allowed parents to say whatever they wished. About 2,000 questionnaires were distributed in 22 primary schools. More than 1,250 (61 percent) were completed for inclusion in the analysis.

The schools were all in a large town near London. Almost all the parents expressed a preference for one of its 15 secondaries. This town may not be typical but the results provide interesting evidence which could easily be replicated elsewhere.

The sample had slightly fewer parents from working class backgrounds than the national average, but because social data were also collected as part of the questionnaire, this imbalance was redressed in the analysis.

Each parent was asked to rank or rate sets of given characteristics of schools in order of importance for their child. They were also asked to list the five most important factors that influenced their choice. In the analysis, parents were grouped according to their preferred secondary school. Their common views were then identified. It was then possible to determine the basis for the parents' selection of each secondary school, and hence the factors that they actually used when distinguishing between them.

An illustration

Economists, when discussing how choice can lead to improved products or services, say that such improvements will be made to those aspects of the product that influence the customer's choice. For example, a washing powder manufacturer, when looking to improve the customer appeal of his product, may decide to improve its cleansing power. This will only be a worthwhile activity if customers are basing their decision to buy on the cleansing power. If the increased power is achieved, and if it is detectable by the consumer, it may lead to increased customer appeal. If, on the other hand, no significant improvement is achieved or the consumer cannot detect the improvement, then increased sales are unlikely.

Market research may indicate that customers are more likely to base their decision on the size and shape of the package rather than on the cleansing power of what is inside. This would lead manufacturers to alter the size and shape of the package rather than the cleansing power of their powder in order to gain customer approval. Although cleaning clothes is the main function of a washing powder, recent advertising suggests that cleansing power is not the basis for customers' decisions about which brand to buy.

In a similar way, one of the major functions of a school is to improve students' academic abilities and these are usually measured by examinations. So, when there is open enrolment, a school should determine how much more appealing it would be to parents if it managed to improve its exam results significantly. This, of course, depends on the extent to which parents base their choice on exam results.

What parents want

I sought parents' views on 44 different educational issues; they also had to list the five most important characteristics of a school.

When this information, plus the parents' scores on seven social status indicators are all considered in a statistical model, only 16 variables provide a significant basis for discriminating between the schools. A school's performance on exam results is not one of those. Hence, it does not appear to be in a school's interest to try to improve its results for the purpose of attracting more parents, and thereby gain more students.

This is not to suggest that schools should not attempt to improve their exam results for other, educational, reasons but that they shouldn't be fooled into thinking that improvements will lead to higher student enrolment.

The analysis did show that parents discriminate between schools on the basis of whether they are coeducational or singlesex (43.6 percent of the discriminatory power), on the basis of whether they have religious connections (10.4

percent) and on whether the school is closest to the family home (5 percent). Together these three factors account for 59 percent of the discriminatory power of all of the significant variables. This could be a result of the parents' strong feelings about the single-sex or coeducational nature of the school, or could be related to the fact that these are undeniable, known facts, available to parents who then choose accordingly.

The knowledge and level of agreement among parents on other educational characteristics of schools is nowhere near as strong. In fact, after the three school type variables mentioned above, only the father's occupational level and whether the child will be driven to and from school, contribute more than 5 percent to the discriminatory power of the model. Most interesting, however, is the fact that a school's performance on exams does not have sufficient discriminatory power to be included in the analysis.

But this does not mean that parents ignore exam results. When asked to say what they thought were the five most important characteristics of a good school, 38 percent listed `good exam results' as one of their five factors. However, when these factors were analysed in terms of the school they had selected, there was no link between their views on results and the school they chose. Instead, the social status of students already attending each school was more important.

Currently, parents cannot compare exam results from school to school. Even professional educators, with all of the exam data for a school, find comparisons difficult. And when they do make comparisons, others, using the same data, often contradict them.

Since a school's performance in exams does not appear as one of the significant discriminators between schools and therefore as one of the bases for parental choice, it is unlikely that efforts to improve these results will lead to an increased enrolment.

What cannot be changed

A school is usually unable to alter its status as co-educational or singlesex, whether it has religious connections or not, or whether it is the closest school to the family home.

So each school must accept that nearly 59 percent of the discriminatory power of the parents cannot be changed. Also a further 20 percent of the discriminatory power is attributed to the social status variables, so only the remaining 21 percent of the discriminatory power is explained by the views of the parents on the educational characteristics over which the schools have some influence. These variables, with their discriminatory power, are listed in the table below.

School factor in order of discriminatory power	Percentage of total discriminatory power
1. Good facilities for computing	4.5
2. Good facilities for music and drama	3.7
3. School groups according to ability	3.1
4. All students wear a school uniform	2.4
5. Child will be happy at the school	2.1
6. School offers a wide range of courses	2.0
7. School has a good reputation	2.0
8. Competent and well-qualified teachers	1.6
Total discriminatory power of these eight factors	21.4

It is the eight characteristics in this table which schools should concentrate on if they wish to improve their attractiveness to parents. But in doing so they should be aware that they can at most affect only 21 percent of all of their discriminatory power. The other 79 percent is beyond their sphere of influence. This could be thought of this way: 79 parents out of a hundred will choose one particular school (or another) because of things about the school which no amount of tarting up or even hard work can change. This leaves 21 parents out of a hundred who will choose that school (or another) because of things which the school can change - getting good computing facilities, encouraging good music and drama, introducing ability grouping (or doing away with it), and so on.

Parallels with Lever Brothers and Colgate-Palmolive

It can be claimed, following my research, that the schools are in the same position as the washing powder manufacturers. But what can be learned from this? Ten years ago the leading washing powder companies based their advertisements on the cleansing power of their products. However, in recent years, because consumers did not or could not distinguish between the different brands on the basis of their ability to clean clothes, the advertising has focused on more peripheral aspects, such as the shape of the packet, the degree of concentration, perfumes, and so on.

Similarly, since parents do not, or cannot, base their decision to select a school for their child on exam results, it is unwise for schools to place too much emphasis on them.

As with the soap powder company, schools hoping to get more customers might be well advised to concentrate on improving their performance on observable and less central aspects.

Notes

Barry Bastow has recently completed a PhD thesis on *A Study of the Factors Affecting Parental Choice of Schools*, under Professor Harvey Goldstein at London University's Institute of Education. He has now returned to Western Australia where he is District Superintendent, Thornlie District Education Office, 1480 Albany Highway, Cannington, Western Australia, 6107.

This article first appeared in the *Times Educational Supplement* of August 2, 1991, and has been published by permission. It has been slightly amended for New Zealand and Australia.

New Zealand readers may find the following interesting:
Education Policy Studies Group, University of Auckland (1990) *What Makes a Good School*, Wellington: GP Print.

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Item 4

set research information for teachers
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SUCCESS IS NOT ENOUGH

DIFFERENCES BETWEEN CHILDREN & CHIMPANZEES

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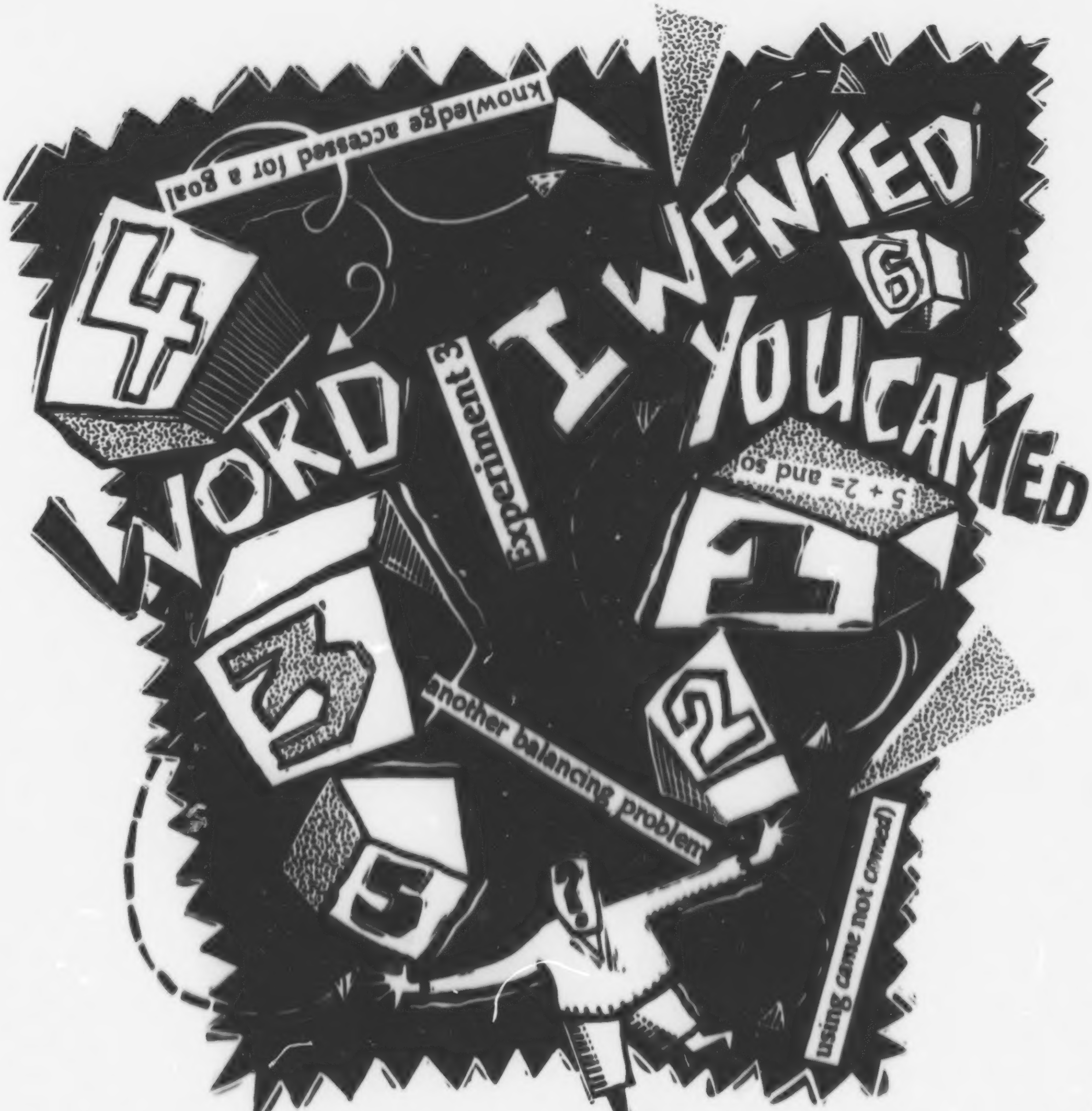
knowledge accessed for a goal
4
WORD
Experiment 3
I WENTED
6
YOU CAMED
5 + 2 = and so
1
3
2
5
another balancing problem
using came not camed

Nicola Belsham

WE USED TO THINK that what made us human was the fact that we had language and no other species did. But in recent years researchers have taught chimpanzees to use language-like systems using words from American Sign Language or plastic chips standing for English words. And we know that, like children, chimpanzees can solve problems and successfully learn from what is around them. So, is there a difference between the human child and the chimpanzee? In fact, big differences show up when we look at what happens **beyond successful learning.** Here are a couple of anecdotes as examples. Then we can look at some experiments.

Yara (4 years): *What's that?*
Mother: *A typewriter.*
Yara: *No. You're the typewriter. That's a typewrite.*

A *typewrite!* Why doesn't the child simply accept the label provided by the adult and use the correct word, *typewriter?* Why has she bothered to work out what the grammarian might call the agentive function of the suffix *-er?* (You can usually take a verb stem and add *er* to make a word for the human agent: *er* to *bake* gives *baker; er* to *teach* gives *teacher;* so why not *er* to *typewrite* and get *typewriter?)*

Now, whatever the chimpanzee's linguistic capacities, I speculate that it would never go as far as the human child. It would never wonder why *typewriter* isn't used to refer to people. It would simply repeat, successfully, the linguistic labels (words) it was given.

Imagine now the child or the chimpanzee trying to reach a biscuit tin to get a biscuit. If they fail to reach their goal by just stretching out, both can find a means to get closer - by shifting a chair, perhaps. (We can describe this as using negative feedback and changing their behaviour accordingly.) But when they succeed is that all? For the chimpanzee, it is. But for the human child it is just the beginning! The human child goes **beyond success.**

It is strange, but this does not always lead to further success. Sometimes children start to fail on the very tasks they originally succeeded at. Yet the failures tell us that they have actually **progressed.** The chimpanzee's contentment with repeating successful solutions points to a limitation. Here are some most instructive examples, first one from physics, then one from language.

Experiment 1

Children were asked to balance a series of long blocks on a fulcrum. There were three types of block:

Type A had their weight evenly distributed so they balanced in the middle;

Type B had plugs of lead invisibly drilled in one end. They looked the same as type A but balanced way off centre;

Type C had visible lumps of lead at one end and also balanced off centre.

Four-year-olds can carry out this task very well. They pick up any block, try it on the fulcrum, move it along, feeling the way it wants to tip, until it is balanced, then they let go. They then take another block and repeat the procedure. For the youngest children, then, there is no problem with this task.

Six-year-olds cannot manage this task well. They try every block at its centre, and if it fails to balance they reject it as impossible to balance. (However, if they are asked to close their eyes they can manage, just as the younger children did.) Something about the visible context impedes the older child from doing what the younger can do very well.

We can see that the older child has learnt to link its experiences of balancing and its long-term memories of balancing into a mini-theory of the way the physical world works. Perhaps it goes something like this: things balance in the middle, these do not, therefore they will not balance at all. By contrast, the 4-year-old has, as yet, no theory about balancing and is simply treating every instance of balancing as an isolated problem. The older child has gone a long way further than the younger child but is less 'successful' now. The older child has, however, a theory which is going to be, perhaps with an understanding teacher's help (or spontaneously) refined into a new, better, more complex theory. Indeed, eight- to nine-year-olds can balance all the blocks again.

Experiment 2

Those of us with small children notice how they make mistakes with the past tense. We correct them when they say *comed* and *goed*, knowing that English is a crazy language and that they will soon get it right. But careful observation of how children acquire the past tense has revealed that it is not as simple as perhaps we think.

Susan Ervin-Tripp in 1973 discovered that children start by saying *came* and *went* correctly. Subsequently they go on to make errors, saying *comed, camed, goed, wented.* Later still they *revert* to the correct forms. This has been called overgeneralisation.

Why does it happen? My explanation is that when children first store *came, went, talked, jumped* and so on in their long-term memories they are stored independent of each other and no links have been made about past tenses in general. All that is there is the sound of the word and its appropriate contextual use. This can be called phase 1. When the child begins to say *comed* and *wented*, this is a sign that the child is in phase 2 and now has 'representational links' between these past tense entries, that is, the child is beginning to form a tense **system.** At this point the child ignores what is going on out there, including the correct models which adults are using, and the 'internal representations' become the focus of attention. The child ignores the evidence whilst getting control of the rules. In phase 3 the exceptions to the rule are noticed and the rule modified and *came* and *went* reappear.

Discussion

The key fact we can see from these examples is that children (and not chimps) go beyond successful interaction with the physical world and start work on the re-organisation of the way their minds organise facts and experiences. This does not always bring 'success'. But these phase 2 'failures' are a step towards proper understanding.

I suggest that for as long as children are at the first phase - where they can output the right behaviour, like the chimp can - they cannot move ahead, no matter how 'right' the answers they give. But real understanding, which can be thought of as making internal representational links, has not begun.

Further examples will help us see when the leap to understanding begins, not just in one domain such as physics or language, but across domains and subjects.

Experiment 3

I set some children another balancing problem. This time a set of scales with a balancing arm was used. The arm had a series of holes in it and could be moved along so that the fulcrum was in the middle or closer to one end than the other. At the end of each arm were hooks on which weights could be hung. The weights were made in the shapes of numbers, 1, 2, 3, etc. The '1' weighed one unit, the '2' weighed two units, and so on, but were more or less the same outward size. Thus with the fulcrum in the centre the weight shaped like a '7' at one end balanced the two weights, '3' and '4' both hooked on at the other end. With the fulcrum out near one end the '1' on the long arm would balance the '7', '6', '4' and '2' all at the short end.

I was interested to see if the children would see this as purely a physics problem, or if they would see the correspondence of weight and number and see it as a problem with a mathematical side to it. Would they use what they knew about numbers to help with the physics problems, or see them as two separate problems?

In brief, the children's initial approach was to treat the 'numbers' as purely physical objects. They hung the 'numbers' on each end expecting them to all be equal in weight (as they were, approximately, in size). However, relatively quickly, they did make a link across the two domains of physics and number. The youngest children used what they knew of number - ordinality and simple addition. The older children used multiplication and proportionality. All of them made links between physics and numbers.

In a further study using this same equipment I tested two intellectually handicapped children who had, nevertheless, good language. The striking result was that neither (aged 15 and 17 years) noticed that the objects to be hung on the arms, were numbers. They did all sorts of elaborate actions physically and succeeded in balancing the arm, showing no sign of noticing that the weights were also numbers. But when I set them simple arithmetical sums orally and on paper they were perfectly capable of reciting the ordinal list of numbers and doing 5 + 2 = and so on. In fact, superficially, they had the same physics and arithmetic skills as the youngest of the normal children but failed to make any cross-domain connections. This suggests that learning difficulties may in part stem from a lack (or reduced pervasiveness) of the ability to draw representational links within domains and across domains.

Discussion

It is important to note that in this experiment, as in the ones before, 'successful' behaviour, (balancing the weights, using *came* not *comed*) on the surface, tells us very little. The behaviour may be like the chimps' - just a response repeated because it was successful. Or, the same behaviour may be the result of working up an understanding that allows for exceptions and makes cross-domain links.

A theory to further explain these differences deals with how we bring knowledge to mind - or, in the modern jargon, how we access it. First we need to draw a distinction between knowledge accessed for a **goal** and knowledge accessed for a **means** to another goal. It appears that when we need to access a fact or process directly, because it is the goal we are looking for, this has to be done consciously. But we may not need a piece of knowledge directly - it may be just something needed in order to accomplish some quite different task. In this case it may need little or no conscious attention. Clear examples are in the next experiments, again one from physics and the other from language.

Experiment 4

This is an extension to the first experiment, balancing unevenly weighted blocks. At a certain age the children resolutely put the blocks on the fulcrum with the exact centre of the block over the fulcrum, rejecting those blocks which will not balance that way. Those children were attending to the task consciously, their knowledge about balancing was called to mind and, in this case, it got in the way of success. Then I took the same children and the same blocks and asked them to build a huge construction, such as a house, out of the blocks. In this new task the children were perfectly successful in balancing the unevenly weighted blocks when the construction demanded it. The goal was not balancing; it was house building, and the information about balancing they needed was accessed indirectly, and correctly, as a means to that goal.

Experiment 5

A colleague, Ionna Berthoud-Papandropoulou, in 1978 asked a lot of children questions about how aware they were of language. She asked, 'Is *table* a word?', 'Is *water* a word?', 'Is *the* a word?', 'Is *of* a word?' Up until about 10 years children did not accept *the* and *of* as words.

In 1986 I gave children the task of pushing a button as fast as possible if I stopped in the middle of a story I was reading. As well as pushing the button they were to tell me the last word I had said. Five-year-olds enjoyed the game, and in repeating my last words included *the* and *of* as well as *table* and *water*, etc.

This doesn't disprove the work in 1978. It shows that the goal we are concentrating on affects the knowledge we access. When the goal requires conscious thought about words, the five-year-olds brought to mind (accessed) a restricted list - those to which they had mentally attached the description, 'word'. When the goal was making a rapid response and repeating the last sound, the concept of what a word is, was not consciously there, and the child could make many more 'correct' responses. What is accessible is not always explicable.

Discussion

These experiments have shown that identical behaviour can stem from very different underlying representations - what we 'know' can be kept in the brain in very different ways, some ways being much more useful and flexible than others. But phase 1, where the knowledge is stored in a simple, procedural, form, is very important. Putting phase 1 knowledge in a broad theoretical framework suggests that rote learning may be a very good first step (but only a first step) to understanding. It may be that reintroducing the long banished concept of rote learning is a good idea, as long as it is seen, strictly, as a **part** of the natural progress to full understanding.

Following the phase 1 rote learning stage the children go beyond that limited success and often they make errors. These errors, in phase 2, *follow* success. They do not necessarily mean that the children have regressed. Rather, they are clues to the fact that the children are working on something new *internally*. Errors have an important status in learning.

Books and papers about child development busily explain how learning often progresses when the learner is confronted with conflicting views. It is even suggested that it is essential for there to be conflicting data if learning is to proceed. However, until phase 2 and 3, when representational links are established internally, conflicting views can sit in peaceful co-existence. This will go on for as long as they are stored *independently* in the long-term memory. Teachers of mathematics have probably come across something like this more often than the rest of us, with children 'learning the rules' but not being able to apply them to actual sums.

How do chimps and children differ in their thinking? It is not just that we have more language, or are conscious of ourselves. We human beings are constantly re-describing and explicating the world, in our minds, and this underlies both fluent language and conscious access to knowledge.

Notes

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This *set* item was adapted from an invited address to the Annual Meeting of the Child Development Society, Institute of Education, London, 29 November, 1986 and printed in their Newsletter No.36.

The model of three phases in the way children store and handle knowledge as they develop is found explained in much greater detail in

Karmiloff-Smith, A. (1984) Children's Problem Solving. In: Lamb, M.E., Brown, L., Rogoff, B. (eds) *Advances in Developmental Psychology, Vol.III.* New Jersey: Erlbaum.

A more recent book on the same topics, looking at the child as linguist, physicist, mathematician, psychologist and notator is

Karmiloff-Smith, A. (1992) *Beyond Modularity: a development perspective on cognitive science.* Cambridge, USA: MIT Press/Bradford Books.

That chimps and other primates can form symbolic representations is amply demonstrated in, for example,

Gardner, R.A. and Gardner, B.T. (1969) Teaching Sign Language to a Chimpanzee. *Science* No.165, pp.664-672.

and for a short, fascinating, easy to read account for the general public

Premack, David and Premack, Anne (1983) *The Mind of an Ape.* New York: Norton.

Experiment 1, balancing weighted blocks. This experiment is reported in

Karmiloff-Smith, A. and Inhelder, B. (1975). If You Want to Get Ahead, Get a Theory. *Cognition*, Volume 3 (3), pp.195-212.

Experiment 2, knowledge of words. The work of Ervin-Tripp is found in

Ervin-Tripp, S.M. (1973) Imitation and Structural Changes in Children's Language. In Ferguson, C. and Slobin, D. (eds) *Studies of Child Language III.* New Jersey: Erlbaum.

Experiment 3, balancing number shaped weights. This is found described in Kamiloff-Smith (1984) listed above.

Experiment 4, an extension of the weighted block experiment. This is found described in Karmiloff-Smith (1984) listed above.

Experiment 5, children's knowledge of what words are. See

Berthoud-Papandropoulou, I. (1978) An Experimental Study of Children's Ideas About Language. In Sinclair, A., Jarvella, R.J., Levelt, W.J.M. (eds) *The Child's Conception of Language.* Berlin: Springer-Verlag.

Annette Karmiloff-Smith has done many experiments with young children and their understanding of how words work. Most of these were left out of this *set* item but can be found in

Karmiloff-Smith, A.; Grant, J.; Jones, M.C.; and Cuckle, P. (in press) Rethinking meta-linguistic awareness: representing and accessing knowledge about what counts as a word. *Cognitive Development.*

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Item 5

set research information for teachers
number one 1992

In the Company of Authors

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Shona McLean

In the Company of Authors

TEACHERS are once more being reproached for failure to make children literate. They are urged to stop using the wrong method or to concentrate on using the right method to teach children to read. And the controversy is as pointless today as it always has been because it is based on misconceptions about how children learn and how teachers teach.

The debate brings into vehement opposition two points of view about how reading should be taught, widely known as the phonics (or 'skills', or 'basics') approach, and the real books (or 'whole language', 'naturalistic', 'emergent literacy' or 'literature-based') philosophy. The issue of 'which is right?' can never be satisfactorily resolved. But first a look at the more basic question of how children learn to read; indeed how they learn anything.

The prevailing view in education today is that learning takes place sporadically, in small amounts, and as a result of solitary individual effort when properly organised and rewarded. Some people are better at learning than others, although anything can be learned if attempted often enough with sufficient 'desire'. But it is likely to be quickly forgotten unless 'rehearsed' or 'refreshed', especially before exams and tests. Learning is *work*. This is the *official* view of learning, taught to most teachers.

But there is an alternative, *informal* view, at least 2,000 years old, and well known in every culture of the world. It is that learning is continuous, spontaneous and effortless. It requires no particular attention, conscious motivation, or specific reinforcement and is not subject to forgetting. The learning is social rather than solitary. It can be summarised in seven words: *We learn from the company we keep.*

The official and informal views of learning are diametrically opposed. It is surprising that so many people can keep both views in their head at the same time. Possibly they store them in different sides of their brain. The official view looks at learning as *memorisation*, while the informal view regards it as *growth*.

That we learn from the company we keep is common wisdom. Every parent knows that children learn to talk exactly like their friends, and to dress, behave and perceive the world exactly like their friends. I have never heard a parent say: 'I don't worry about the kids that my son goes about with - he's a slow learner.' Children do not behave the way they do through ignorance, in fact they cannot be *taught* to behave differently. They talk and dress and see the world the way their friends do because that is the kind of person they see themselves as being. They have acquired an identity. It should not be surprising that attempts to make children behave in ways contrary to how they see themselves can be so unavailing.

Learning, in other words, is social and developmental. It is a matter of how we see ourselves - and our identity is also determined for us socially. We learn who we are from the way others treat us, from the people who share interests with us and help us to do the things they do.

Tremendous but unsuspected amounts of learning are accomplished in this way. Children learn about 20 new words a day, every day, at the age of four. By the time they enter school they know around 10,000 words. By the time they leave they know at least 50,000; maybe ten times that number (depending, not surprisingly, on how much reading they do). They are familiar with the grammars used by the company they keep. They learn intricate intonation patterns, formal and informal speech registers, and a multitude of idioms.

They learn with great subtlety and exactitude how to present themselves to the world (like the kind of person they learn they are). They learn who they might become, and who they are unlikely ever to become. They learn if they are to be readers and writers.

When experimental psychologists began studying learning just over 100 years ago, they did not look at what was learned by people from the company they kept. That was not regarded as 'scientific'; it was in the province of anthropologists, not experimentalists. Psychologists studied learning in laboratory situations that could be experimentally manipulated and controlled. Interest and past experience were regarded as 'extraneous variables' that 'contaminated' experiments and interfered with statistical reliability and replicability. Instead, the experimenters looked at how individuals learned nonsense in isolated conditions wholly contrived by the experimenter. Learning nonsense was and still is termed 'pure learning'.

In a typical learning experiment, subjects are seated in rows in a room sealed off from the outside world, warned not to help each other, and given a list of about a dozen nonsense items to study - syllables or sequences of digits that make no sense to them - for a controlled amount of time. They are required to return several days later to see how many items they can recall. And if they can remember only a few of the items, the test result tells them that they did not learn very much. No attention is paid to informal learning that takes place - like what the experimenter looked like, what the room was like, how difficult and boring the task was, and the fact that the subject 'didn't learn very much'; matters that may well be remembered for life. The fact that repetition and effort facilitates the memorisation of nonsense became established as a fundamental 'law of learning'.

This became the *official* theory of learning - because learning could be guaranteed, provided enough time and effort was spent on a task. The experimenters, incidentally, also discovered a less well-publicised law of forgetting. Subjects started to forget the meaningless items they had memorised from the lists (though not what they learned informally from the experimental situation) immediately after the last learning trial.

And education adopted the official theory of learning - lock, stock and barrel. (The law of forgetting was forgotten.) Classrooms became like experimental laboratories.

Learning became a matter of individual effort, students were required to memorise items on lists, teachers started keeping scores, collaboration became cheating - and students whose test results were low were told they hadn't learned very much. What students actually and inevitably *learn* - their feelings about the utility and attainability of what they are taught, and about their teachers and themselves - receives no attention until a student is diagnosed as having special needs and learning problems.

If children learn from the company they keep, how do they learn to read? To answer this question, there is no point in looking for evidence from the experimental laboratory or from educational statistics. It is irrelevant to consider how children struggle in the classroom through exercises in reading instruction. We should look at how they come to terms with printed language.

There is massive evidence that two groups of people - two kinds of company - together ensure that children learn to read. The first group is the people who read to children, the first step in ensuring that they 'join the literacy club'. The simple act of reading to a child puts him or her in the company of people who read, shows what can be done with reading and, most important, it puts the child in the company of *authors*, who take care of the actual teaching of reading.

Margaret Spencer, of the London University Institute of Education, has documented how authors teach reading. The books must be ones that children know well - the favourite stories that are known by heart or the predictable stories where it is obvious what a word will be before it is actually encountered. The child already knows the words, and *the author shows the child how to read them.*

The authors of books that children read make them familiar with written words. This is no more complex for beginning readers than learning to recognise the sounds and meanings of spoken words, 20 a day. And the more written words children are able to recognise, the easier it is for them to understand and learn new ones. Authors also teach the meanings of words. And they have the advantage of being infinitely patient and tolerant collaborators. They don't bring a child to order every time a mistake is made, attention wanders, or a difficult or boring passage is skipped. Authors give control to children. Children who read independently *know* they are engaging in interesting and powerful behaviour.

In asserting that children learn to read by reading, it may sound as if I am contradicting my argument that learning is a social activity. But readers keep the company of the authors they read, and the company of all the characters they read about. Readers can become members of any club in the world; it enables them to escape solitude. Readers are never alone.

For as long as there have been records of organised reading instruction, the emphasis has been on teaching the sounds of letters. It is instructive to consider why this should be the case, since there is no compelling evidence that teaching children phonics makes them readers, and no reason to believe that it could do so.

The 'rules' of phonics are too complex (more than 300 correspondences between letters and sounds) and they are too unreliable (there is no letter that does not represent more than one sound, including silence, and no sound that cannot be represented by more than one letter). The most flagrant exceptions occur in the most common words - like *I, you, they, is, are, was, of, by, have, has* and *mother.*

It is no more possible to read by attempting to transform letters into comprehensible sounds than it is to spell by attempting to transform sounds into readable sequences of letters. The worst spellers spell phonetically, just as the worst readers try to sound out unfamiliar words according to phonic rules.

Nevertheless, there are reams of research claiming to show that phonics should be the method of choice in teaching reading. The studies on which such claims are based usually compare children taught by one method with children taught by another on criteria falling far short of actual reading. Reading is seen as decoding to sound rather than the achievement of meaning, and there is almost always an underlying assumption that one way or another, children must learn phonics.

So why does phonics instruction have such a seductive appeal, despite such conflicting or questionable research claims? Why do so many teachers feel that at least some phonics instruction is essential? The first reason must be that letters are such an obvious part of written language. Anyone who can read can recite (in a highly simplistic way) the correspondences of letters to sounds. Therefore it is believed that teaching these correspondences will produce readers. The idea seems *manageable* from a methodological point of view. This is the same kind of reasoning that makes people believe that the way to teach computing, driving or sailing is to teach the names of all the different parts and the mechanics of all the different functions.

A second explanation for the attractiveness of phonics is a fear that children won't learn if their learning isn't organised in the smallest detail. Such reasoning has always been self-reinforcing. The fact that so many children have difficulty learning under systematic instructional discipline is taken to prove that they need even more systematic instructional discipline. Phonics and other structured methodologies have particular appeal to individuals who need to feel in control.

Of course, some children learn to read despite exposure to phonics. These children make phonics look good. In effect, phonics becomes a separate subject that they master. Phonics is always easy if you can already read a word - it is always the non-readers who have trouble with phonics. And the blame is always put on these children for being 'dyslexic' or having other kinds of 'specific learning disabilities', or on their teachers for not having tried hard enough or for using the wrong method.

Phonics also survives because there is no alternative method of teaching reading that is more successful. People who perceive learning from the official rather than the informal point of view do not consider that it might be methodology itself that fails. Changes in method can be no more significant for the learner than changing the colour of the walls when opening the windows is required. But the failure of the alternative method is taken as a validation of phonics.

The traditional alternative to phonics has been the 'whole word' method of teaching complete words. In one sense, this approach is unarguable. The more words you know, the easier it is to recognise and learn other words, based not on phonic correspondences but on syllabic and semantic resemblances. Learning to read is basically a matter of learning to identify more and more written words, just as learning to talk is basically a matter of learning the meanings and uses of more and more spoken words. The trouble with the whole word method of teaching reading is that someone decides in advance the order in which the individual words will be learned. This is about as useful to the beginning reader as it would be for an infant to be told in advance the words that are to be learned in the course of each day. Words, spoken and written, are learned when they are important and meaningful to learners, not to suit the whims or theoretical predilections of instructional designers.

Children cannot learn to recognise enough whole words to become readers - not if they are expected to learn lists of words in advance of reading. They must first become readers so that they can encounter new written words in the company of supportive authors.

Now the proponents of phonics have found a new enemy, commonly labelled *real books* or *whole language*. Obviously this 'trendy' alternative cannot be blamed for any recent decline in test scores; most children are still confronted by some form of phonics instruction, aggravated by the growing harassment of discriminatory tests.

However, the critics are again half right. The real books alternative will not succeed in teaching children to read if regarded simply as another method of instruction. And unfortunately large numbers of teachers regard real books as just another method; they still do not trust children to learn unless their attention is controlled and their 'progress' monitored and evaluated. They do not realise that the underlying principle is membership of the reading and writing club.

The original philosophy of real books and whole language, even before they acquired their rather misleading labels, had nothing to do with methods, materials or techniques. There was no attempt to tell teachers what they should *do* to teach children to read. Rather the aim was to tell teachers what their attitudes should be.

The basis of the position was *respect* - respect for language (which should be natural and 'authentic', not contrived and fragmented), and respect for learners (who should be engaged in meaningful and productive activities, not in pointless drills and rote memorisation). The philosophy has attracted enthusiastic support from scores of thousands of teachers across the English-speaking world. It is the most vital movement in education today.

But the philosophy has also been exploited by many publishers, distorted by teachers who do not understand the philosophy, and misused by administrators incapable of modifying their organisational systems or theoretical mindsets. There is the absurdity of teachers offering children a choice of books but providing no help in reading the chosen book (which the child would probably not have voluntarily selected). Children do not learn to read by osmosis (maliciously said to be a real books belief), nor by being left to their own devices. They need encouragement and assistance. Teachers do not abdicate responsibility when they move to real books (the way they can abdicate responsibility when they blindly work their way through a reading scheme).

Children will not all learn what we want them to learn when we want them to learn it, no matter how understanding — or rigorous — their teachers might be. Children are individuals, no more to be standardised than adults can be standardised. The best we can do — and it is a great distance from where we are at the moment — is to do everything we can to promote interest and competence in literate activities, and to ensure that there is a minimum of guilt and anguish on the part of teachers, students or parents.

Most teachers are good teachers some of the time and not so good, or downright awful, at others. Good things happen in most schools some of the time, and regrettable things happen at other times. The proportions must be changed. Unfortunately, many teachers, parents and administrators often cannot distinguish the desirable from the deplorable.

The most productive way to deal with the reading controversy would be to take it into every school and every community, to be dissected, discussed, and honestly argued, free from slogans and political rancour. The debate may never end, but it could serve to keep in the consciousness of all teachers - and of politicians and the public at large - the profound importance and delicacy of the noble art of teaching.

Notes

DR FRANK SMITH is a British educational writer and researcher living in British Columbia. He was a professor at the University of Victoria. He is also the author of *Reading*, *To Think*, and 13 other books on language and learning.

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Thx rxxl bxxks dxbxtx xs pxxntlxss

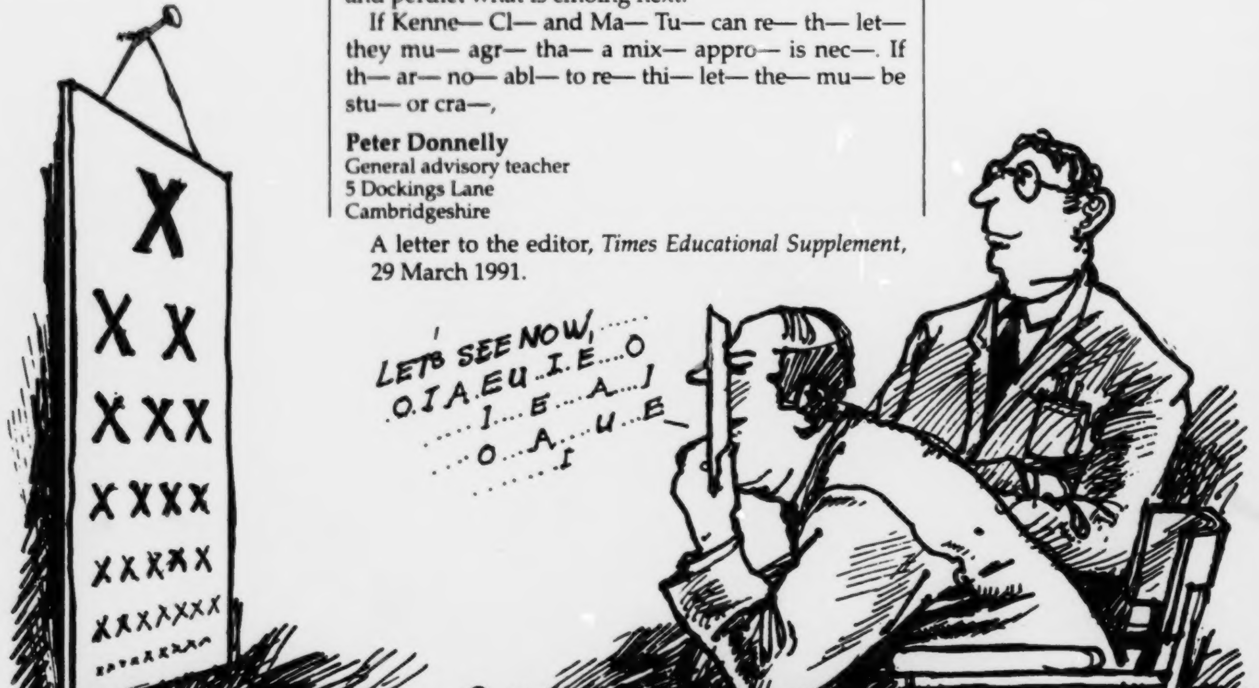
WHXN wxll thx rxxl bxxks xrgxxmxnt xnd? Sxrxly xt mxst bx clxxr thxt chxldrxn usx a vxrxxty of strxtxgxxs tx rxxd prxnt xnd thxt xn xndxrstxndxng xf thx rxlxtxxnshxp bxtwxxn lxttxrs xnd sxxnd xs xnly xne xf thx strxtxgxxs.

It muts be fairyl obvoius to aynone raeding thsi lettre that raedres draw on thier konwledeg of how lagnuaeg wroks, thier abitily to recgonise wrods on sihgt and theri capacity to ues contextaul cleus to enabel them to maek senes of what has goen befoer and perdict what is cmoing next.

If Kenne— Cl— and Ma— Tu— can re— th— let— they mu— agr— tha— a mix— appro— is nec—. If th— ar— no— abl— to re— thi— let— the— mu— be stu— or cra—,

Peter Donnelly
General advisory teacher
5 Dockings Lane
Cambridgeshire

A letter to the editor, *Times Educational Supplement*, 29 March 1991.



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READING
BUT NOT UNDERSTANDING

Susan Dymock
Waikato University

Kerry Gemmill

Introduction

THERE IS AN AGE-OLD CONCERN that children are not reading for meaning. This concern may stem from earlier teaching practices: as early as 1831, at the Sessional School in Edinburgh, the emphasis in reading instruction was on pronouncing words with accuracy and fluency; whether the young reader understood what was read was not important; understanding, it was felt, would come later. In short, the goal of the teacher was to ensure the young reader became a proficient decoder.

Although skill in decoding and skill in comprehension usually go hand in hand, this is not always the case. There are a number of children who decode quite well yet have comprehension difficulties.

There is no obvious reason why some good decoders have trouble comprehending. However, research by

Watson and Clay has shown that the problem is not caused by children being given material that is too difficult. Nor is the problem due to asking unanswerable questions. Instead, these readers fail to comprehend what other good decoders have no problem with.

According to Goodman some readers are so obsessed with reading for accuracy that they forget to read for meaning.

> *Remedial reading classes are filled with youngsters in late elementary and secondary school who can sound out words but get little meaning from their reading.*

The child who is sounding-out words but getting little meaning is sometimes said to be 'word-calling', or even 'barking at print.' The picture of remedial classes being full of such children is rather a stereotype, but it does suggest that an over-emphasis on decoding is the cause of poor comprehension. Frank Smith (who has an article in this issue of ***set***) also holds this view.

> *Overconcern with accuracy has the effect of directing too much attention to individual words... making comprehension... impossible.*

Such comments suggest that skill in decoding may actually interfere with comprehension.

Keith Stanovich, a reading researcher in the USA, invented the term 'the Matthew Effect' from Matthew 25: 'To everyone who has will be given more, and they will have more than enough, but those who have not, even what they have will be taken away.' He refers to the way good reading leads to better learning, but poor reading leads to less and less learning. He argues that word-callers may be poor readers because the words that they 'call' may not even be in their listening vocabularies. So what a child is 'reading' would be mis-comprehended even if the child was not reading, but just listening to it. This is rather akin to most of us adults 'reading' a medical textbook — we can sound-out the technical words but have no idea what the diseases, conditions or drugs are. He makes a second point, suggesting that word-callers may not be as good at decoding as they seem. If Stanovich is right about this, comprehension would be poor because decoding skill was not good enough.

Peter Gough in America and Bill Tunmer in New Zealand have a similar view. Their 'simple view' of reading suggests that if the reader is a good decoder then the only reason for poor comprehension is poor listening comprehension. If listening comprehension is poor, then even if the test were read aloud (and there was no need to decode a single word) comprehension would still be poor.

The problem of word-calling seems to occur when the child is about nine years old. In the first years of school, the young child faces reading material which is familiar in content and narrative in structure. But by the age of nine or ten the young reader begins to face increasingly complex text material which does not tell a story but explains new facts and figures and uses arguments. This prose is called *expository* in structure. Unless the reader has tools to deal with the increasing complexity of text, comprehension will begin to suffer. This has been called in the USA the 'fourth grade slump', fourth grade being for 9-year-olds. But word-calling could also be related to intelligence. Jensen claims that once skill in decoding is achieved, reading comprehension is closely associated with mental age [IQ].

Keith Stanovich suggests that problems with word calling could be related to what children have done with their decoding skills. He suggests that good readers read more, and this helps to improve their vocabulary and general knowledge, which in turn has an impact on their overall academic achievement, including scores on intelligence tests. So differences between good and poor comprehenders, even when decoding ability is the same, may be due to differences in how much the children have read. Over time, some good decoders may have read more than others, and in this way built up more general knowledge, which enabled them to do a better job comprehending what they read.

In short, there are a number of possible reasons for word-calling, other than such children being obsessed with sounding-out words.

The purpose of this study was to find out why some children appear to be word-callers, good decoders who have problems with comprehension. Goodman and Smith would predict that word-calling is due to an overemphasis on decoding accuracy. In other words, they would predict that word-callers would be better at listening than reading. In contrast, Gough and Tunmer would predict that poor comprehenders (who were good decoders) must have problems with listening. If listening is the cause, then there would be no difference between reading and listening scores. This study tried to find out which view was correct.

The Children

Thirty-two children, 12 boys and 20 girls, averaging 12 years of age, were selected. They attended a suburban school in a middle class area, in a provincial city. Using the Burt Word Reading Test (NZCER, 1981) and an informal reading inventory (Department of Education, 1981) screening tests had been given to 70 children. The resulting data were used to select the 32 children for the study. These children read orally with fluency and accuracy for their age yet differed significantly in comprehension. They were divided into two equal groups, one being of good decoders who were also poor comprehenders. The children in the second group were both good decoders and good comprehenders.

Materials and Apparatus

Four graded expository passages were used. The reading level ranged between 12 and 15 years. The passage length was between 335 and 391 words in 5 to 10 paragraphs. Each passage had a set of six questions. Three of the questions had the answers explicitly stated in the text and three questions had answers implicitly stated.

The listening materials consisted of the four graded expository passages which were audiotaped. The reading rates were strictly controlled.

The decoding test material for the main study consisted of a word list for each passage. This list was the passage typed in backwards order. For example, the sentence, 'Bats are the only mammals which are able to fly' appeared as

fly
to
able
are
which
mammals
only
the
are
Bats

These lists were read before the child first read, or listened, to each passage. This provided a further check that the children were good at decoding.

Following the initial reading or listening, the children were asked to judge the passages. They did this by rating their own understanding, their ability to remember passage details and the amount of background knowledge they possessed about the ideas in the passages. Finally the children completed a profile which focused on their reading habits and their attitude towards reading.

The Design

All children read and listened to the same four passages, but in varying orders. Children were randomly assigned to either reading/listening or listening/reading.

The design of this experimental study creates 'practice effects'. It was expected that children would get higher scores for listening when the passages came to them in read/listen order, since they were processing the same text twice. Likewise, children would get higher scores for reading, when given them in listen/read order. However, by counterbalancing the order in which children read or listened to texts, it was hoped that practice effects would balance out overall.

The Procedure

The testing took place in an office or classroom that was not being used at the time. Both experimental groups followed the same procedure. All children commenced by reading the word list (it provided a measure of decoding accuracy level.) Children then either orally read two passages, then listened to another two passages, or listened to two passages and then orally read two passages.

Immediately after reading or listening to each passage, the children orally recalled passage details and then were asked six questions about the passage. The same set of questions were answered, whether the children read the text, or listened to it. Finally, each child rated the passage on the three aspects of comprehension. After all four passages were tested, the child completed a profile which focused on reading habits and attitude towards reading.

Results and Discussion

The results showed that all of the children read with accuracy and fluency. That is, they were good decoders. The overall averages for errors when reading the list, errors when reading the text, and reading time, are reported in Table 1, below.

Table 1

Decoding Fluency Averages, for Baseline Data

	Good Comprehenders	Poor Comprehenders
List accuracy	99.13%	99.20%
Context accuracy	98.92%	98.88%
Reading Time (words per minute)	134.49	127.31

When recalling passage details and answering comprehension questions, the poor comprehenders' reading and listening scores were both equally low. The good comprehenders had reading and listening comprehension scores that were both equally high (see Table 2, below).

Table 2

Recall of Passage Detail and Comprehension Questions - Averages

	Recall of Passage Details		Comprehension Questions	
	Reading	Listening	Reading	Listening
	%	%	%	%
Poor Comprehenders	42.71	43.75	45.58	43.10
Good Comprehenders	65.33	70.04	80.73	78.77

By comparing the listening and reading comprehension scores it is possible to see if decoding or listening comprehension is the cause of poor comprehension. If excessive attention to decoding is a cause of poor comprehension then listening would be better than reading. If, however, listening was the cause, then there would be no difference between reading and listening scores. These results supported Gough and Tunmer's simple view of reading. Because reading and listening scores were equally low, when reading accuracy was high, **the problem of poor comprehension seems due to these children's general language comprehension.**

I checked that practice effects were not interfering with the results. When the data were analyzed, they showed that there were no practice effects operating on passage recall. However, when answering comprehension questions, results showed that there were significant practice effects: listening scores were higher in the read/listen and reading scores were higher in the listen/read order. But the differences were similar. Overall the practice effects balanced themselves out. In short, there was no dramatic improvement for the poor comprehenders when they were listening, as the Goodman-Smith analysis suggests should have occurred.

Attitudes to Reading

Perhaps one reason for the poor listening ability of these word-callers was that they were not as keen readers as the good. So, by 12 years of age, the differences between the two groups may have reflected the impact of Matthew effects in vocabulary and comprehension. There were also distinct differences between good and poor readers' attitudes towards reading and reading habits. The survey data showed, if given the choice of watching television or reading, 73 percent of the good readers would read, whereas only 27 percent of the poor readers would choose to read.

The good readers also read more. Over a period of a month, the good readers read twice as many books as the poor readers. These survey data also showed that although both groups enjoyed listening to their teacher read, the good readers enjoyed it more. And while both groups felt they were good readers, the good readers judged themselves better readers than the poor judged themselves to be. These data suggest that there were negative (Matthew) effects operating for the poor comprehenders.

What can teachers do?

In practical terms, this group of good decoders who were having problems with comprehending did not seem to need further instruction in decoding. Instead they seemed to require assistance in developing their listening comprehension. This assistance could come not only by encouraging the amount of in-school and at-home reading 'mileage', but also through instruction in vocabulary, and in comprehension strategies. These interventions may help to reduce the Matthew effects that have apparently contributed to their poor listening comprehension.

Conclusion

The results of this study provided an answer to one question of particular concern, that is, why do some good decoders have problems comprehending what they read? The answer seems clear. The comprehension problems of these 'word-callers' are due to problems with listening comprehension, rather than with decoding. If the Smith and Goodman positions were correct, then these word-callers would have achieved better comprehension when listening than when reading, since they did not have to 'word-call'. Yet this did not happen. Instead, their listening comprehension was no better than their reading comprehension. So, decoding does not seem to interfere with comprehension among children whose decoding skills are well developed. Instead, this study provided support for the Stanovich and Gough/Tunmer positions, that once a child has become a good decoder, differences in reading ability will reflect differences in listening ability.

Notes

MRS SUSAN DYMOCK carried out this research whilst a M.Ed student at University of Waikato. She can be contacted at 770 River Road, Hamilton, New Zealand.

This item was abstracted from

Dymock, S.J. (1991). *Poor comprehension amongst good decoders: Is the problem due to 'word calling' or language comprehension?* Unpublished M.Ed Thesis, University of Waikato, Hamilton, New Zealand.

Details of the Watson and Clay study can be found in

Watson, S., & Clay M. (1975). Oral reading strategies of third-form students. *New Zealand Journal of Educational Studies*, 10, 43-51.

The quotation from Goodman is found on p.491 in

Goodman, K. (1973). The 13th way to make learning to read difficult: A reaction to Gleitman and Rozin. *Reading Research Quarterly*, 8, 484-493.

The quotation from Smith is found on p. 139 in

Smith, F. (1978). *Reading without nonsense*. New York: Teachers College Press.

Stanovich provides a detailed account of the phenomenon of the word-caller in

Stanovich, K. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 11, 360-406.

Gough and Tunmer's view of decoding is clearly expounded in

Gough, P.B., & Tunmer, W.E. (1986). Decoding, reading and reading disability. *Remedial and Special Education*, 7, 6-10.

Gough's ideas are also available in ***set***

Nicholson, Tom (1986). Good Readers Don't Guess, in ***set*** No. 2, 1986, Item Nos. 13 and 14.

That the 'fourth grade slump' is a possible cause of poor reading comprehension is raised in

Chall, J.S. (1983). *Stages of Reading Development*. New York: McGraw Hill.

The claim that reading comprehension is closely related to IQ made by Jensen can be found in

Jensen, A.R. (1980). *Bias in Mental Testing*. New York: Free Press.

That some children may be unused to expository writing and need help is discussed in

Calfee, R. and Associates (1981). *The Book: Components of Reading Instruction*. Stanford, CA: School of Education.

Smith can be read in this issue of ***set*** and in

Smith, F. (1988). *Understanding Reading* (4th ed.) Hillsdale, NJ: Erlbaum.

Another researcher who believes comprehension is dependent on decoding is Juel, who can be read in

Juel, C. (1988). Learning to read and write. A longitudinal study of 54 children from first grade through fourth grades. *Journal of Educational Psychology*, 80, 437-447.

That children should be given material that matches their listening ability is discussed in

Carver, P. (1987). Should reading comprehension skills be taught? In Readence, J.E. and Baldwin, R.S. (Eds.) *Research in Literacy: Merging Perspectives*. Rochester, NY: National Reading Conference. pp.115-126.

That some children may require help in developing vocabulary and reading comprehension is discussed in

Barton, J., and Calfee, R. (1989). Theory becomes practice: One program. In D. Lapp, J. Flood & N. Farnan (Eds.) *Content Area Reading and Learning: Instructional Strategies*. Englewood Cliffs, NJ: Prentice Hall, pp.366-378.

The Matthew Effect: the term comes from Keith Stanovich and refers to Chapter 25 of the gospel of Matthew - To everyone who has will be given more, and they will have more than enough, but those who have not, even what they have will be taken away.' It is discussed, with good advice about how to help poor reading and comprehenders, in

Nicholson, Tom (1991). *Overcoming the Matthew Effect: Solving Reading Problems Across the Curriculum*. Wellington: NZCER.

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Item 8

set research information for teachers
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Titular Colonicity and Scholarship Revisited:

Research and Scholarly Impact

Michael A.R. Townsend
University of Auckland

UNDER-DRESSED DIMWIT!

IN AN ISSUE OF *American Psychologist*, Dillon (1981) argued that titular colonicity (the presence of a colon in the article title) is a correlate of scholarly quality. His investigation began with the casual impression that publication titles in psychology and education are hard to read, long, complicated and awkward. Closer inspection revealed that most of the recent titles contained a colon. Intrigued by the role that the colon might play in scholarly publication Dillon extracted 474 unpublished titles from current volumes of *Dissertation Abstracts International* and *Resources in Education*, and 314 published titles from current issues of ten journals each in psychology, education and literary criticism. Scholarly journals were contrasted with nonscholarly journals.

Dillon found that 72% of titles in scholarly journals contained a colon, while only 13% of titles in nonscholarly journals contained a colon. Some suggestion of the colon being causally related to publishability across a research career was evident in the education titles. Colonic titles were low in the early career publication of *Dissertation Abstracts* (11%) and *Resources in Education* (20%), high in mid-career scholarly journals (66%), followed by a plummetting to 6% in non-scholarly journals. Evidence from another study indicated that titular colonicity is currently four to five times greater than in 1950. In summary, 'The colon characterizes scholarly publication, correlates with scholarly productivity, manifests complexity of scholarly thought, denotes scholarly distinction, and marks scholarly progress' (p. 880).

This conclusion suggests that journal scholarship might be determined objectively through an analysis of titular colonicity. One purpose of the current investigation was to compare the frequency of titular colonicity in New Zealand journals with that of North American journals as reported by Dillon. A second purpose was to examine a shortcoming of Dillon's conclusion, that it fails to address the aspect of scholarship known as scholarly impact. Scholarly impact can be assessed by frequency of citations and, extending Dillon's conclusion, it was predicted that titles containing colons would receive more citations than those without colons.

Method

A brief informal survey among colleagues revealed that, with complete unanimity, the *New Zealand Psychologist* (NZP) and the *New Zealand Journal of Educational Studies* (NZJES) were rated the most scholarly journals for publication of psychological research in New Zealand. These journals began publication in 1972 and 1966 respectively. Every issue of these journals through to 1981 was searched for psychological articles and to note the presence or absence of a colon. No attempt was made to establish the reliability of the procedure, but in two instances where the index page of a journal was inadvertently photocopied and scored twice, the tallies were identical. This resulted in 266 titles (112 in NZP and 154 in NZJES).

For comparison purposes the proportion of colonic titles was also calculated for all issues of the *Australian Journal of Psychology* (AJP) from 1972-1981 (250 titles), the *New Zealand Bulletin of Psychology* for 1954 and 1955 - the only volumes available in the Auckland University library - (21 titles), and all titles listed in Pickens' (1979) list of unpublished studies in education for 1975-1978 (353 titles).

To investigate the relationship between titular colonicity and citation frequency two colonic and two non-colonic titles were selected from each of the 1977 volumes of 10 scholarly journals in psychology (e.g. CD, EPM, JAP, JCCP, JEP, JPSP). The journals were selected from Koulack and Keselman's (1975) lists of the major journals in the various fields of psychology. Citation counts for the 40 articles were obtained from the Social Sciences Citation Index for 1977-1981. Self citations were excluded.

Results and Discussion

Titular Colonicity in New Zealand

To achieve comparability between NZP and NZJES, the 1966 to 1971 volumes of the latter journal were analyzed separately. During that time 12 (26%) of the 46 psychological article titles contained a colon. Of historical interest, the first recognition of the importance of a positive residual following the Post CC-Pre CC transformation was G.A. Nuthall's (1969) titular 'Research Note: Sex differences in ratings of the occupational status of teaching.'

Across the 10 volumes from 1972 to 1981 for both journals combined the colonicity rate was 28%; the rate for NZP was 28% while for NZJES it was 29%. Given the North American colonicity rates of 72% for scholarly journals and 13% for nonscholarly journals it might be suggested that the local journals are 39% as scholarly as scholarly American journals and more than twice as scholarly as nonscholarly American journals. At the same time it might be claimed that the local journals are slightly more scholarly than the *Australian Journal of Psychology* which has a colonicity rate of 26%.

The reasons for the difference in colonicity between North America and New Zealand are not clear. It may be that local editors and authors strive for simpler, more readable titles in published research. Thus, it might be expected that there would be a type of hemispheric inversion of the North American figures in which local unpublished research titles would exceed published titles in colonicity. This expectation was not confirmed in Picken's data of 353 unpublished titles - titular colonicity was only 12%. Alternatively, the lower local colonicity rate may reflect the tendency of local scholars to publish their most scholarly (colonic) research in scholarly North American journals.

There is some evidence that local researchers are being encouraged in the use of titular colonicity. When the volumes for 1972-1976 are contrasted with those for 1977-1981 there is a rise in colonicity from 22% to 34% (paralleled by a similar rise in AJP). Most of this increase can be attributed to NZP which increased from 15% to 40%. This local increase in colonicity is even more evident when the recent titles are compared with those in the *New Zealand Bulletin of Psychology* for 1954 and 1955 when colons were used a mere 5% of the time. On the basis of a linear projection the New Zealand journals should approach the current colonicity of the scholarly American journals by 1997; for NZP it could be ten years earlier.

Of interest to Dillon's claim of a relationship between colonicity and scholarly productivity, the six most productive scholars (those with five or more publications in the two journals, exclusive of replies, counter-replies, and counter-counter replies) had a colonicity rate of 31%, slightly in excess of the overall rate. All six scholars (Clay, Elley, Glynn, Maxwell, Stacey and Tuck) had colons among their published titles, although only Clay (67%) and Stacey (60%) were predominantly colonic.

Colonicity and Citations

The 20 colonic titles yielded a total of 707 citations while the 20 non-colonic titles yielded 217 citations. However, a large proportion of this superiority was due to a single paper which had 340 citations; the median frequencies were 8.5 and 5.0, respectively. A nonparametric randomization test of the mean differences (Siegel, 1956) revealed a marginally significant superiority of citation frequency for the colonic titles, $t = 1.34$, $p < .10$ (one tail).

It is clear that the emergence of the colon as a correlate of scholarship is present in New Zealand research titles. Twice as many colons are found in titles published in scholarly journals than are found in unpublished titles, and it is a device used by all of the most productive local scholars. Colonic growth is dramatically emphasized in the eight-fold increase in the psychological journals between 1954-1955 and 1976-1981. However, conclusions about the scholarly significance of the colon must be tempered by the finding that titular colonicity is only weakly related to scholarly impact as measured by frequency of citations.

The preceding comment notwithstanding, aspiring scholars must recognize the increasing importance of sesquipedalian research titles which are characterized by an elongated post-colonic clause and a cadence unrelated to normal speech. Deft and subtle placement of the colon brings its own rewards.

Footnote

Antipodites are clearly maintaining their level of scholarly excellence. In 1991 nearly 300 additional titles were scanned from the 1982-1990 local journals, using similar criteria to those used in 1983. Over the last eight years, titular colonicity was 33% in the *New Zealand Journal of Educational Studies*, 37% in the *New Zealand Journal of Psychology*, and 33% in the *Australian Journal of Psychology*. However, the growth of scholarship has, unfortunately, slowed. The previous (linear) estimates of parity with North American scholarship (TC = 72%) have been disproved. A more sophisticated analysis reveals that the relationship might more accurately be described as vascillating-parabolic, with the point of intersection being closer to the year 2396. There is clearly an urgent need for local scholars to push harder in their attempts to give colonic visibility to their research.

Notes

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Item 9

set research information for teachers
number one 1992

Memorable Text

Michael F. Graves
University of Minnesota

Wayne H. Slater
University of Maryland

Z Z Z
Z Z Z Z Z
YAWN
YAWN
YAWN

Shona McLean

Memorable Text

TEXT BOOKS can be as dry as dust. Unfortunately, attempts to make the knowledge in them more memorable have had little success; in fact, we know of only four research projects which have produced results significant to teachers.

We had the feeling that several features of textbook writing (rather than the layout and illustration) needed to be changed. We also felt that writers and scholars not involved in educational research were likely to have insights about clear and memorable text. Accordingly, we picked writers from three distinctly different backgrounds and asked them to use whatever knowledge they had to revise two passages from a history text to make them more comprehensible.

Writers Participating in the Study

The first were two people whose training is in linguistics and psychology. Academics in these disciplines tend to take a structured and formal approach to analyzing writing; they teach courses about language, but do not teach people to write.

A second pair were trained teachers of English composition. They emphasised the process one goes through in writing more than the product.

The third group were popular magazine writers - people who learned much of what they know about writing on the job, and who themselves write for a living. Our writers were two former Time-Life editors.

The Experiments

In each of two experiments we asked these pairs to work together to revise two history passages written for 16-year-olds. The aim was to make them more understandable and memorable. We then asked 16-year-old students to read the original and revised versions of the passages and write what they recalled immediately after reading them.

The Texts

We used two passages from ordinary text books. The results were so similar that in this *set* item we will give illustrations from only one, a passage on Vietnam. Here is part of the original school text, rather typical of the whole book, we are afraid. The whole passage is 407 words long and contains 127 distinct facts or ideas.

Original Vietnam Passage

Communists Threaten South Vietnam

The most serious threat to world peace developed in Southeast Asia. Communist guerrillas threatened the independence of the countries carved out of French Indo-China by the Geneva conference of 1954. In South Vietnam, Communist guerrillas (the Viet Cong) were aided by forces from Communist North Vietnam in a struggle to overthrow the American-supported government. During the Kennedy administration the United States sent some 10,000 servicemen as advisers, instructors, pilots, and supporting units to help the South Vietnamese government build a military force to fight the Viet Cong. In President Kennedy's opinion, preserving the independence of South Vietnam was of 'vital interest' to the United States.

After President Johnson took office, he continued to follow the Kennedy policy of limited support for the South Vietnamese government. Then, in the summer of 1964, North Vietnamese torpedo boats were thought to have attacked two American destroyers in the Gulf of Tonkin. In response, Johnson ordered an air strike against North Vietnamese coastal bases. But during the presidential campaign of 1964, the President made it clear that he did not want to broaden the war.

The Vietnamese War Is Escalated

Shortly after the election, Communist gains prompted President Johnson to alter his policy concerning Vietnam. American military forces in Vietnam were increased from about 20,000 men in 1964 to more than 500,000 by 1968. Even so, North Vietnamese troops and supplies continued to pour into South Vietnam.

Linguists' Revision

American Responses to Communist Threats in South Vietnam

In the 1950's, the most serious threat to world peace developed in Southeast Asia when Communist guerrillas threatened the independence of countries in French Indochina. In South Vietnam, in particular, Viet Cong guerrillas were aided by forces from Communist North Vietnam in a struggle to overthrow the American-supported government. Under the Kennedy administration, American support consisted of 10,000 servicemen, functioning as advisers, instructors, pilots, and supporting units. In President Kennedy's opinion, helping to preserve the independence of South Vietnam was of 'vital interest' to the United States.

The Kennedy policy of limited support for the South Vietnamese government continued under President Johnson. He maintained this policy even after North Vietnamese torpedo boats were thought to have attacked two American destroyers in the Gulf of Tonkin in the summer of 1964. In response to the naval attack, he ordered an air strike against North Vietnamese coastal bases, while making it clear during his presidential campaign that he did not intend to broaden the war. However, President Johnson finally altered his policy of limited support when Communists made military gains in South Vietnam. Specifically, he increased American forces in Vietnam from about 20,000 men in 1964 to more than 500,000 by 1968. But this increase did little to stop the influx of North Vietnamese troops and supplies into South Vietnam.

Composition Teachers' Revision

Vietnam: America In Quicksand

The 'Quicksand War.' That's what the American involvement in the Vietnam War has been called. The United States, having first made only a few 'limited' commitments in that area, was gradually drawn into a full-scale, costly war. To understand how this could happen, we have to understand President Lyndon Johnson.

Johnson had more firsthand knowledge of Vietnam than most of his subordinates. As Vice-President under Kennedy, he had gone on a fact-finding mission to Vietnam. At that time, there were really two Vietnams. The communists controlled North Vietnam while the U.S. supported the South Vietnamese government.

Johnson discovered that America's efforts to help the South were not working. He realized that in South Vietnam communist guerrillas were fighting to overthrow the government. Although the U.S. had sent some 10,000 servicemen as advisers, instructors, or pilots to help the South Vietnamese government fight the guerrillas, Johnson concluded that sending advisers and trainers wasn't getting the job done.

Johnson Escalates The War

Johnson was re-elected in 1964. During the campaign, he insisted that he did not want to send young men to die in Vietnam. But after the election, it looked more and more like the communists would overthrow the South Vietnamese government. As a result, Johnson changed his mind, and the American people learned a new word - ESCALATION. Over the next four years, Johnson increased military forces in Vietnam by 25 times!

But this enormous increase failed to deter communist troops and supplies from pouring into South Vietnam.

Time-Life Editors' Revision

Communists Infiltrate South Vietnam

While America triumphed in peaceful competition with the Communists in space, in political competition the United States was far less successful. The battle ground, once more, was in Southeast Asia: South Vietnam, one of the fledgling nations sculpted out of French Indo-China by the Geneva peacemakers in 1954. In the early 1960s, South Vietnam was just a small splotch of colour on President Kennedy's map, a country so tiny and remote that most Americans had never uttered its name. Yet in Kennedy's eyes, this pro-Western nation was 'the cornerstone of the Free World in Southeast Asia, the keystone to the arch, the finger in the dike.'

South Vietnam's American-backed government was endangered, under attack from within by Communist guerrillas, the Viet Cong. Village by village, road by road, these jungle-wise rebels - aided by their Communist neighbour, North Vietnam - were waging a war of ambush and minings. They darted out of tunnels to head off patrols, buried exploding booby traps beneath the mud floors of huts, and hid razor-sharp bamboo sticks in holes. President Kennedy was alarmed. Determined to block a Communist takeover, he dispatched some 10,000 servicemen as advisers, instructors, pilots, and supporting units to help the South Vietnamese muster a military force able to grapple with the formidable Viet Cong.

After Kennedy's assassination, President Johnson continued his predecessor's policy of limited support for the beleaguered South Vietnamese government. Then, suddenly in the summer of 1964, two American destroyers were apparently attacked by North Vietnamese torpedo boats in the Gulf of Tonkin. In retaliation, Johnson ordered the Air Force to strike North Vietnam's coastal bases. Yet he held back from more extensive action. As he campaigned for election in 1964, Johnson insisted that he would not fan the already flaming Vietnamese conflagration.

The Vietnam Bomb Explodes

No sooner had Johnson won the election than Communist gains prompted Johnson to reverse his stand. American forces in Vietnam skyrocketed from 20,000 men in 1964 to more than 500,000 in 1968. But undeterred by leech-infested jungles and swarms of buzzing insects, undaunted by flash floods that made them cling to trees to escape being washed away, North Vietnamese troops streamed southward without letup along the Ho Chi Minh Trail.

The Revisions

As well as asking the three pairs of writers to make the original more readable, understandable, and memorable, we also asked them to work together, thinking aloud and to record why they were making the revisions they did.

The thinking that went into the revisions was fascinating. Again we give only snippets of what they said.

The Linguists

Our revisions consisted of a variety of textual manipulations. In general, we attempted not to add information to the texts or delete information from them, but the revised versions did contain some additional information. This was included to establish ties between the texts and the world that exists outside of the texts. For example, we inserted the phrase 'In the 1950's' at the beginning of the Vietnam passage.

... some revisions were designed to strengthen ties within the texts. In some cases, we added cohesive conjunctions to help signal the type of semantic relationships existing between adjacent sentences or adjacent paragraphs. For example, we inserted the word 'Subsequently' at one point in the Vietnam passage in order to explicitly signal a relationship that was both temporal and causal. In other cases, we created ties by the reiteration of elements: the use of exact repetition, synonyms, and superordinate terms....

The order of ideas in the texts was changed so that the order of events in the texts conformed to the chronological order of events in the world.

Finally, the order of the ideas in the text was also changed so that relatively important ideas were placed in appropriate textual positions.

In summary, the linguists' revisions were organizational or structural changes, and they were directed at such matters as clarity, coherence, and emphasis. They subtracted some information, thought superfluous, in their final version.

The Composition Teachers

... The six main purposes we had in mind when revising the passages were simplifying technical information, adding background information, clarifying information, supplying transitions, emphasizing key material, and keeping the passages smooth and readable.

In attempting to achieve these purposes, we made three sorts of changes: vocabulary changes, structural changes, and additions and deletions of information. At the vocabulary level, we substituted words, added words, or deleted words in order to clarify, simplify, or emphasize information. For example, we changed the phrase 'Stalin's death' to 'the death of Soviet Premier Joseph Stalin' to fully specify just who had died....

At the structural level, we rearranged sentences or words within sentences in order to further clarify,

> simplify, or emphasize information, or to make a sentence smoother or more readable. For example, we moved the sentence, 'Communist aggression continued around the world,' so that it directly followed a sentence indicating that there had been no letup in the tensions of the Cold War in order to put these two key thoughts near each other....

Like the linguists, the composition teachers concentrated primarily on clarity, coherence, and emphasis. They also tried to avoid changing the content of the passages, but did make some content changes in their final version.

The Time-Life Editors

The Time-Life editors took a very different tack. They did not sit down together and revise the passages as did the other pairs. Instead, the junior member of the team did the writing, and the senior member critiqued and edited it.

When my assistant managing editor and I received two excerpts from a high school history textbook, we were aghast. Before us lay some of the driest prose we had ever had the displeasure of reading. Our first thought was to discard the passages entirely and simply begin writing new ones from scratch, because no Time-Life editor would have revised such woefully inadequate texts. This, however, was not what we had agreed to do, and so we worked from the existing passages.

Since my role was that of the writer, I began the revision process, experimenting first with the language of the passages. To intensify the action, I replaced weak verbs such as 'tried to get,' 'moved,' 'fight,' and 'increased' with words such as 'tried to lure,' 'hustled,' 'grappled with,' and 'skyrocketed.' I added metaphors, changing, for instance, 'The Vietnam War Escalated' to 'The Vietnam Bomb Explodes.' I also added colloquialisms such as 'a go ahead for an invasion' to make my version more conversational than the original.

Above all, I sought to build a sense of drama. Consider 'Though the Chinese Communists periodically bombarded Quemoy and Matsu, they did not risk an invasion of the offshore islands.' This sentence became 'Though the Communists did not dare to invade Quemoy and Matsu, their periodical air raids on the islands continually reminded the U.S. that Red China was indeed a force to be reckoned with.'

However, tinkering with the language did not give the passages a Time-Life quality: they were still too panoramic, too impersonal. In the words of my assistant managing editor.

> the factors included in these samples resist interesting presentation, cannot stimulate readers to learn more, and fail to inform adequately about the events of the respective periods. They are too vague about things that are interesting and significant, and too specific about details that no-one will remember or care about.

To enrich the content, I inserted 'nuggets' gleaned from library sources. Nuggets are vivid anecdotes and details that remind us that PEOPLE, not events, make history. A Time-Life story is not so much a sequence of events as a string of nuggets. The nuggets I inserted included facts about the 'cold war' over seating arrangements, the Chinese Nationalists' disillusionment, the Viet Cong's ingenious traps, the perilous Ho Chi Minh Trail, and the daily air strikes.

I also incorporated choice words from Presidents Eisenhower and Kennedy. After all, why should the textbook quote Kennedy's statement that South Vietnam was of 'vital interest' to the U.S. when Kennedy so graphically called the country 'the cornerstone of the Free World in Southeast Asia, the keystone to the arch, the finger in the dike'?

The Time-Life editors certainly did not confine themselves to making structural changes; they changed content and they changed it with a vengeance. Equally importantly, their attempt was not limited to making the passages lucid, well-organized, coherent, and easy to read. Their revisions went beyond such matters and were intended to make the texts interesting, exciting, vivid, rich in human drama, and filled with colourful language.

The Research

After trying out the revised passages we were so surprised with the results that we got the writers to check and revise their revisions before trying them out again. The passages in the panels are these second revisions.

Table 1

Original and Second Revisions compared

Passage	Writers/Editors	Number of words	Number of distinct factors or ideas
Korea (not reprinted here)			
	Original	412	135
	Linguists	441	143
	Teachers	403	142
	Editors	730	260
Vietnam (First half reprinted here)			
	Original	407	127
	Linguists	362	132
	Teachers	370	128
	Editors	548	181

Results

Our results were extraordinary. The children who read the Time-Life editors' version made a 36% improvement. From the linguists' and teachers' versions the improvements were 20% and 19%.

However, soon after we published the results, Tom Duffy led a team which got completely opposite results. They used our final versions of the Korean War passage but very different tests of whether the facts were remembered. In their research the composition teachers' revision was the most effective, the Time-Life editor's version least effective.

In a second partial replication of our original study Britton and his colleagues also failed to reproduce our results. In their case the teachers' versions were again the best. They were, however, working with older students and gave them different instructions.

The Duffy study had been very like our own, so we decided to run our experiment again, eliminating two design flaws. The results are quite unlike our original results. Children appear to learn best from somewhat dull unadventurous prose!

The Replication

The children in our own replication study were 16-year-olds in a lower-middle class suburb of Minneapolis. Each pupil received only one version of the passage and these were distributed randomly. On the first day they were asked to read the passage, put it back in its envelope, and write all that they could recall from it. The next day they were asked to write down, again, everything they could remember from the passage, then to do a short-answer quiz on the passage, then an attitude survey on how interesting the passage had been, on its difficulty, its organisation and style.

This time, taking both passages together the table comes out like this:

Table 3

Replication: Percentage of facts and ideas remembered

	Facts and ideas remembered from			
	Original	Linguists' revision	Composition Teachers' revision	Time-Life Editors' revision
Day 1 : Immediate Recall				
Both Korea and Vietnam	11.4	9.6	13.9	10.3
Day 2 : Delayed Recall				
Both Korea and Vietnam	7.3	6.8	9.8	7.5

Table 4

Replication:
Percentage of correct answers in short-answer quiz

	Facts and ideas remembered from			
	Original	Linguists' revision	Composition Teachers' revision	Time-Life Editors' revision
Both Korea and Vietnam	1.5	1.3	1.7	1.3

The Attitude Survey, which had 16 items, showed that the composition teachers' version was better liked than the others.

Discussion

How can the contradictory results be explained? What are the lessons to learn?

Firstly, it seems correct to reject the first findings and accept those of Duffy, Britain and our own replication. There were gaps in the methodology of the first study.

This suggests strongly the value - perhaps even the necessity - of replication. The results of our original study were widely accepted and, in fact, celebrated by people from a variety of backgrounds: researchers with special interest and expertise in text design, journalists, historians, teachers, and even the general public. Those findings did not, however, stand the test of replication, a fact that obviously could not have been discovered without attempts to replicate the study.

Second, taken together, the four studies testify strongly to the fallibility of expert judgment. Two of the teams of expert writers failed to make any real improvement in the comprehensibility of the text, and two other teams were successful with only some texts. At the same time, research results are no guarantee of truth, as the replications showed.

When we submitted an article on the replication to the *Reading Research Quarterly*, Suzanne Hidi and Mark Sadoski made a number of insightful and helpful observations that provide some very reasonable explanations of our results. We want to acknowledge Hidi's and Sadoski's contributions and to present some of their explanations and some of our own here.

The first concerns the reason for the failure of the Time-Life revisions. There are now a number of studies that indicate that the inclusion of interesting but unimportant information frequently disrupts the learning of important ideas . Snippets of such interesting but unimportant information, termed 'seductive details' by Garner are often themselves remembered: however, they do little to promote recall of important (but not closely related) information. Many of the anecdotes and nuggets provided by the Time-Life writers are seductive details.

A second explanation is about why the composition teachers' revisions were successful. Not only were their revisions coherent and well-organized, but they also contained a good deal of interesting information. Importantly, however, instead of adding interesting but often irrelevant information - seductive details - as did the Time-Life writers, the composition instructors added interesting information that focused on the main ideas of the passages.

Hidi has pointed out that the composition teachers' rewrite focused on Johnson as the man who was central to the escalation of the war. Also that the teachers used terms that were more expressive and described more intensive actions, making the central points of the text more interesting. Examples of these are 'did not want to send young men to die in Vietnam,'... 'enormous increase,'... 'failed to squelch the inevitable flow,'... 'mighty military power,'... 'ESCALATION,'... 'Vietnamese were both stronger and wiser,'... [and] 'American wallowed in the quicksand war for six more years.'

We checked on this idea by analysing the passages looking for topics that deal with death, danger and sex - topics that tend to create 'absolute interest'. In the Vietnam passage 49% of the composition teachers' statements were classified as creating absolute interest, one percent more than in the Time-Life editors' revision.

Improving Textbooks

We have to remember that we were not judging the quality of the lessons being taught. From a Vietnamese point of view most of this history, in all versions, (especially the Time-Life editors' version) would be regarded as a travesty of the facts, and most European historians would consider the view, at least, biased. Our research considered the usefulness of different versions to students' learning from the texts: did this version, or that, get the facts across more efficiently (never mind the truth of the facts and attitudes)? We are not able to comment on the quality of the ideas. Quality textbooks need, first and foremost, quality ideas.

As teaching tools, textbooks can be improved, though not dramatically. Duffy and colleagues, say, 'school texts are terribly inadequate.' We found that vividness and liveliness were almost totally lacking. However, vividness and liveliness are not virtues that can exist alone: there is the broader concept of being interesting. Textbooks can not teach if the material chosen to go in them is basically dull.

We must also note that our research concentrated on how well the passages helped factual recall. No sophisticated educator would claim that the ability to recall factual information is the goal of studying, especially in History. We certainly need ways of measuring how well students integrate information from texts into their existing knowledge base, or the extent to which a text has presented information in such a way that it will shape students' world views or in some way affect their lives.

Notes

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The first results, later upset by the replications, can be found in

Graves, Michael F., et al. (1988) Some Characteristics of Memorable Expository Writing: Effects of Revisions by Writers with Different Backgrounds. *Research in the Teaching of English*. Vol.22, No.3, October.

The replication and discussion of the results are given in detail in

Graves, Michael F.; Prenn, Maureen C.; Earle, Lason; Thompson, Mary; Johnson, Vivian; Slater, Wayne H. (1991) Improving Instructional Text: Some Lessons Learned. *Reading Research Quarterly* 26/2.

Further discussion can be found in

Graves, Michael F. and Drum, Priscilla A. (1990) *Factors Influencing Text Difficulty: Some Considerations When Selecting Reading Material*. An unpublished paper available from the authors.

Beck, Isabel L.; McKeown, Margaret G.; Growmol, Erika W. (1989) Learning from Social Studies Texts. *Cognition and Instruction*. Vol.6, No.2, pp.99-158.

Calfee, Robert C. and Chambliss, Marilyn J. (1987) The Structural Design Features of Large Texts. *Educational Psychologist* Vol.22, Nos.3 & 4, pp.357-378.

Studies which have shown revision to be of little use include

Anderson, J.R. and Reder, L.M. (1979) An elaborative processing explanation of depth of processing. In L.S. Cermak and F.I.M. Craik (eds.) *Levels of processing in human memory*. Hillsdale NH: Erlbaum, pp.385-403.

Brandt, D.M. (1979) Prior knowledge of author's schema and the comprehension of prose. *Dissertation Abstracts International*, Vol.39, 5605B-5606B. (University Microfilms No. 79-11113)

Roen, D.H. and Piche, G.L. (1984) The effects of selected text-forming structures on college freshmen's comprehension of expository prose. *Research in the Teaching of English*. Vol.18, pp.8-25.

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Phifer, S.J., McNickle, B., Ronning, R.R. and Glover, J.A. (1983) The effect of details on the recall of major ideas in text. *Journal of Reading Behavior*. Vol.15, pp.19-30.

Slater, W.H., Palmer, R.J. and Graves, M.F. (1982) Effects of directions describing passage structure, signaling, and elaboration on readers' recall. *Research on Reading in Secondary Schools*. Vol.9, No.2, pp.1-25.

Voss, J.F., Tyler, S.W. and Bisanz, G.L. (1982) Prose comprehension and memory. In C.R. Puff (ed.) *Handbook of research in human memory and cognition*. New York: Academic Press, pp.349-393.

The four studies which have shown educationally significant results (with relatively typical and lengthy texts) are

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Brennan, A.D., Bridge, C.A. and Winograd, P.N. (1986) The effects of structural variation on children's recall of basal reader stories. *Reading Research Quarterly*, Vol.21, pp.91-104.

Slater, W.H. (1985) Revising inconsiderate elementary school expository text: Effects on comprehension and recall. In J. Niles and R.V. Lalik (eds.) *Issues in literacy: A research perspective*. Rochester, NY: National Reading Conference, pp.186-193.

Slater, W.H. and Graves, M.F. (1986) *Revising expository text to improve its comprehensibility*. Unpublished manuscript, University of Maryland, College Park.

The Linguists cited literature that informed their work, referring to

Chafe, W.L. (1970) *Meaning and the structure of language*. Chicago: University of Chicago Press.

Clark, H.H. and Haviland, S.E. (1977) Comprehension and the given-new contract. In R.O. Freedle (ed.) *Discourse production and comprehension*. Norwood, NJ: Ablex, pp.1-40.

de Beaugrande, R. (1980) *Test, discourse, and process: Toward a multidisciplinary science of texts*. Norwood, NJ: Ablex.

Dillon, G.L. (1981) *Constructing texts: Elements of a theory of composition and style*. Bloomington, IN: Indiana University Press.

Grimes, J.E. (1975) *The thread of discourse*. The Hague: Mouton.

Halliday, M.A.K. and Hasan, R. (1976) *Cohesion in English*. London: Longman.

Meyer, B.J.F. (1975) *The organization of prose and its effects on memory*. Amsterdam: North-Holland.

Schank, R.C. and Abelson, R.P. (1977) *Scripts, plans, goals and understanding: An inquiry into human knowledge structures*. Hillsdale, NJ: Erlbaum.

The teachers of composition cited literature that informed their work, referring to

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Beach, R. and Eaton, S. (1984) Factors influencing self-assessing and revising by college freshmen. In R. Beach and L.S. Bridwell (eds.) *New directions in composing research*. New York: Guilford Press, pp.149-170.

Bridwell, L. (1980) Revision strategies in twelfth grade students' transactional writing. *Research in the Teaching of English*. Vol.14, pp.197-222.

Collins, J.L. and Williamson, M.W. (1984) Assigned rhetorical context and semantic abbreviation in writing. In R. Beach and L.S. Bridwell (eds.) *New Directions in composing research*. New York: Guilford Press, pp.285-296.

Flower, L. and Hayes, J. (1980) The cognition of discovery: Defining a rhetorical problem. *College Composition and Communication*. Vol.31, pp.21-32.

Mandel, B.J. (1978) Losing one's mind: Learning to write and edit. *College Composition and Communication*. Vol.29, pp.362-368.

Murray, D.M. (1978) Internal revision: A process of discovery. In C.R. Cooper and L. Odell (eds.) *Research on composing*. Urbana, IL: National Council of Teachers of English, pp.85-103.

Sommers, N. (1980) Revision strategies of student writers and experienced adult writers. *College Composition and Communication*. Vol.31, pp.378-388.

The original and revised versions of the passages were parsed into idea units by two raters using a modified form of prose analysis from

Meyer, B.J.F. (1985) Prose analysis: Procedures, purposes and problems. In B.K. Britton and J.B. Black (eds.) *Understanding expository text: A theoretical and practical handbook for analyzing explanatory text*. Hillsdale, NJ: Erlbaum, Part I, pp.11-64, Part II, pp.269-304.

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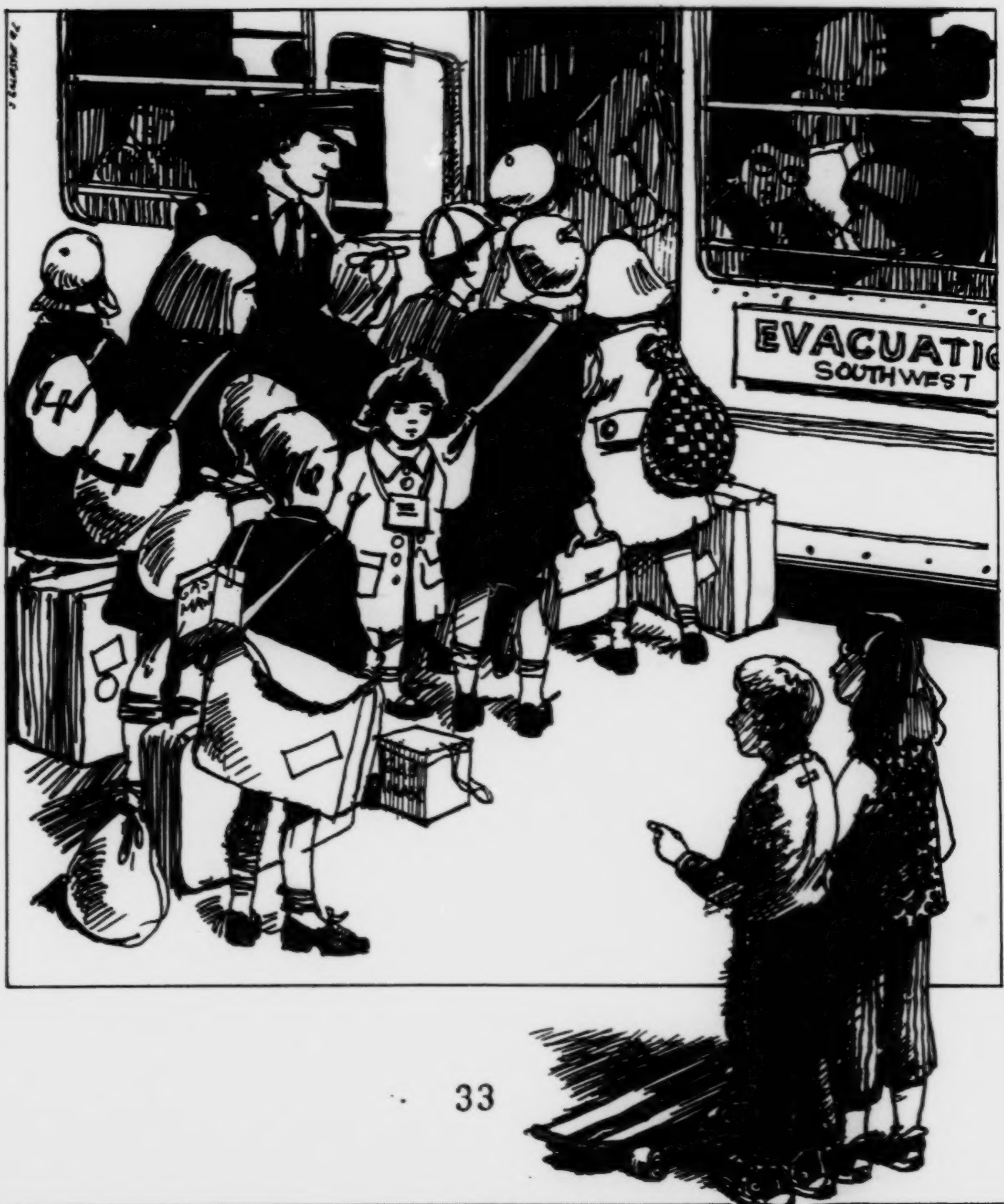
Item 10

set research information for teachers
number one 1992

Fact + Fiction = Faction

Roy Twitchin
National Foundation for Educational Research in England and Wales


EVACUATI
SOUTHWEST
GAS MASK

John Gillespie

Fact + Fiction = Faction

Every few months an outbreak of disease takes all the fun out of eating yet another staple.

Similarly every so often some aspect of television becomes 'cause for serious concern', according to politicians, or the press, or a pressure group. It is deemed to be 'very bad for you', and action is demanded to ensure that the **'public'** is protected from the latest menace. Usually such a worrying scare peaks rapidly, then dissipates as it is supplanted by the next one. However, there is reason to believe that the latest 'media malady' may prove to be a particularly hardy strain that we will just have to learn to live with.

I am referring to the increasing incidence of FACTION.

Faction, or docu-drama, is the use of the presentation techniques of one genre of television programme - documentary - to present another kind of programme - drama - and vice-versa. The conventions which we have come to accept as being the exclusive province of each genre, are overlapping increasingly. We often find it difficult to tell 'fact' from 'fiction'. As we shall see, recent research at the National Foundation for Educational Research in England and Wales (NFER) has highlighted the difficulties facing pupils and teachers when they try to sort out the versions of reality presented by different genres of television programme, and particularly those programmes which feature 'genre-blends', like faction.

This could prove rather a thorny challenge to schools in Britain since both the new *National Curriculum for English*, and the report of the *Working Party for History*, set attainment targets requiring pupils to perform just such a task. Since television programmes are so international it will be a problem soon enough in other countries too.

Why use faction?

The temptation for media producers to use unconventional formats to present their stories whether they are ostensibly fiction or non-fiction must be considerable. The proliferation of media products in the last fifteen years or so has created an unprecedented demand for material. Hundreds of free newspapers need copy. The burgeoning number of local radio stations requires enormous amounts of programming, and the dozen or more channel selector buttons on our television sets are fast assuming a function other than ornamental. The competition thus engendered is another factor in the constant quest for new ways to present information and entertainment. Technological advances have also contributed to our acceptance of new and bizarre combinations of programme types. Television sets with 'picture-in-picture' facilities allow us to watch and listen to a programme on one channel whilst watching an inset image of another programme. 'Zapping' - flipping from one channel to another using the remote control - enables several programmes to be followed concurrently, with the viewer constantly having to accommodate to different generic conventions.

Political factions

Certain faction programmes have been highly sensitive politically. *Death on the Rock* about the shooting of IRA suspects in Gibraltar and *Who Bombed Birmingham?* also about the IRA, utilized dramatic reconstruction techniques using original sources. A number of criticisms were made of these programmes, focusing on the difficulties of sorting out fact from fiction. Some critics consider that the use of a documentary-type format gives a false impression of veracity to the events as portrayed. Others feel that the use of such a format is a shelter for timorous dramatists, who should be 'seeking the truth through art'. There is some irony in such criticism in Britain: the ultimate legal process, the courtroom trial, which requires of the protagonists that they tell the truth, the whole truth, and nothing but the truth, is strictly off limits to television.

When access to primary sources is denied, a substitute will inevitably be devised. Older viewers may recall that during the Falklands War news footage from the South Atlantic was non-existent. News bulletins offered ingeniously dramatized and animated cartoon strips as an alternative!

The 'reconstructions' which have become a popular feature of crime programmes like Crimewatch with its mixture of highly dramatic 'thriller' inserts and studio-based police officers and presenters, have also caused considerable disquiet. It is the proximity of 'reality' to the events portrayed that makes them simultaneously fascinating and repellent. The ability of programme makers to toy so readily with our emotions is resented by many, especially when almost any viewer might have been in the position of the victim dramatically portrayed in the reconstruction.

Of course, invoking empathy with characters is a basic ingredient of many narrative forms and has also featured prominently and controversially in approaches to the teaching of History in our schools. What sense do children make of programmes which employ techniques of genre-blending? How adept are they at sorting 'fact' from 'fiction'?

Classroom factions

As part of the APU (Assessment of Performance Unit) oracy survey of eleven-year-olds, a video task was devised to include exploration of this aspect of children's understanding of television. Three hundred and eight children undertook the task, in groups of four. Each group was shown extracts from a television programme, and asked to discuss within the group certain features of the extracts. These were taken from a programme in the Yorkshire Television series for schools, *How We Used to Live*. The featured programme *Goodnight Children Everywhere!* was concerned with the evacuation of children at the beginning of the Second World War.

How We Used to Live is a very popular series with fourth-year junior school children. Its form is comparable to that of a soap opera, with a repertoire of characters and a continuous story-line. The set of programmes dealing with the Second World War integrates authentic wartime documentary and instructional film within the modern 'historical drama', featuring the lower middle class Hodgkins family. The programmes use the device of dissolving from the coloured images of the drama to the black and white of the documentary inserts.

The extract shows a dramatization of children being evacuated. They line up in their school playground, then file on to a coach, to the strains of Flanagan and Alan's 'Run Rabbit Run' on the sound track.

As the children are driven off, the coloured image dissolves into black and white, and wartime archive footage of the evacuation process is shown with a voice-over explaining the procedures. The image then reverts to colour, and the drama continues.

The process by which children make judgements about 'reality' is a complicated, subjective and changeable one. To them, television programmes themselves range between two extremes, with none being totally 'real' (for most viewers), and none totally 'unreal' (again, for most viewers).

One function of the task was to enable pupils to consider the potentially confusing blend of different film and television genres - of documentary, instructional and drama. During piloting of the video task, a repertoire of potential responses was drawn up which was referred to by the assessor and a note taken if pupils made a similar response when discussing the extract within a framework of a series of questions.

The variety of pupils' responses to the discussion points, confirms the complexity involved in making 'reality' judgements. On being asked to discuss why part of the extract was in black and white, 40 percent said that 'black and white' meant 'in the past'. Twenty-six percent said that 'black and white' meant 'real life or documentary'. However, 10 percent said that 'black and white' meant 'they couldn't afford colour'.

Each group was asked to discuss which parts of the extract, the black and white part or the parts in colour, were more realistic, and why. Thirty-six percent were convinced that the black and white part was more realistic, because 'it is more authentically old', and, as the series is supposedly set in the past the fact that 'they didn't have colour then' confirmed its authenticity for 18 percent of pupils. 1 percent of pupils observed that in the black and white parts 'we don't know who the people are'.

The black and white part of the extract is also differentiated by having a voice-over commentary, the 'authenticity' of which none of the assessors, let alone the pupils, could ascertain! This difference was commented on by 5 percent of pupils.

As many televisual features are specifically designed to be non-intrusive and unnoticed transition devices, they therefore pose particular difficulties when attempts are made to identify and discuss them.

Music and songs are used in television programmes to establish a mood, for dramatic emphasis and to contribute to narrative flow. Song lyrics can be supportive of mood, or provide an ironic counterpoint to the visual image.

The purpose of using the words and music of 'Run Rabbit Run' in the extract was seen by 45 percent of the pupils as referring to children 'running away', that is, being evacuated to safety. The song is played as the children in the extract queue up and file on to a coach. Nine percent of pupils mentioned the function of the song as being 'so the children can get on the bus'. A number of pupils expressed surprise at the way both functions were served simultaneously.

The **National Curriculum for English 5-16** lays considerable emphasis, with the Attainment Targets for Reading, on pupils' ability to:

> recognize, in discussion, whether subject matter in non-literary and media text is presented as fact or opinion.

The final report of the **National Curriculum History Working Group** similarly states that pupils should be able to:

> distinguish opinion from facts and information, and understand in a general way why there may be disagreements in the interpretations.

The video task revealed little evidence that teachers are equipped with the skills necessary to embark on even such a limited enterprise. There is an urgent need for an accessible, critical vocabulary to enable teachers and pupils to discuss television programmes whether they stick to the conventions of their genre, or whether they appear in one of a possible multitude of combinative forms.

The **National Curriculum History Working Group** shows a certain wariness towards the use of audio-visual media in the classroom:

> The aural and visual aspects of History provide a theoretically limitless potential for radio and television school History broadcasting. But it must be recognized that the selective visual image of television is potentially much more misleading - because more insidious - than misrepresentations in print. The National Curriculum offers an opportunity for a better and more effective partnership between school History, radio and television .

'Faction', the interweaving of ostensibly factual and fictional forms of television, cannot be disinvented. If the opportunities envisaged by History and English teachers are to be used constructively, a simple critical framework is needed which enables faction, and any other combination of televisual forms that may emerge in the future, to be discussed in a way that allows assumptions embedded in programme presentation techniques to be identified and challenged. Such a framework for discussing versions of reality, coupled with a general acknowledgement that there are no monopolies of the truth, would offer a good basis for a healthy, critical diet.

Notes

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This item first appeared in *TOPIC*, a production very like *set*, published by NFER/Nelson. It was in *TOPIC* No.6, Item 1, (1991).

The report of the APU oracy survey of 11-year-olds can be found in
Language for learning: a summary report on the 1988 APU surveys of language performance (draft report), Slough: NFER.

That children see television programmes as neither totally real nor totally unreal is discussed in
Hodge, B. and Tripp, D. (1986) *Children and Television*, Oxford: Polity Press.

The full reference for the Attainment Targets for Reading is
Great Britain Department of Education and Science and the Welsh Office (1989) *English for ages 5-16 (Attainment Target 2: Reading: Description of Level 5)*, London: HMSO.

The full reference for History targets is
Great Britain Department of Education and Science and the Welsh Office (1990) *Attainment Target 2: understanding points of view and interpretation of history: description of level 5, National Curriculum History Working Group final report.*

The second quotation from the History targets is from Section 10:14.

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set research information for teachers
number one 1992

'Our Teachers Never Come Back After Christmas':

Teacher Satisfaction, The Community and School Improvement

Alan Watson
University of New South Wales

Kerry Gemmill

'It will be hard to know which class to put you in next year. Your work has been so good all the teachers will want to have you in their class,' said the Principal to some 8-year-olds.

'You won't have to worry about it, Miss. You won't be here.'

'Why?' she asked.

'Our teachers never come back after Christmas.'

THE HIGH RATE OF TEACHER turnover had not escaped some of the youngest members of the school community. In many locations it is a major stumbling block to school improvement.

Recent research I have been carrying out with colleagues looked at the adjustment and satisfaction of NSW teachers in their second year of service. We also traced the relationship of satisfaction to staff stability and mobility in difficult-to-staff areas. The findings have important implications for every system where there are locations (metropolitan or rural) to which teachers are reluctant to go.

Not only bureaucratic systems need to take heed - teachers and communities can help.

Good Teaching

The past few years have seen some of the most dramatic changes in Australian education for over a century. But will they produce better schools? Many elements make up the good school but the heart of the matter is the quality of the interaction of the teacher and the learner. All else may be changed but if the effectiveness of the teaching does not improve, the rest will not amount to much.

The central question for improving our schools is, 'How can *teaching* be improved?' Like parenting, teaching is a hard job to do well. Good teaching cannot be reduced to simple terms that will operate as a recipe for its improvement. And teachers cannot be *forced* by administrative requirement to make improvements. A teacher can go through the motions, meeting externally determined standards, but still teach very badly. Good teaching depends ultimately on the *commitment* of the teacher. This is what makes teaching a profession. Furthermore, good teaching is a *marathon* not a sprint. It requires effort each day, for weeks and months, to produce a result.

The difference between good teaching and ordinary teaching is a subtle one that is not likely to be discerned by the casual observer. As John Goodlad the leading American researcher in this field points out, good classrooms are different in *degree*, not in *kind*. They have *more* of the qualities that matter; teacher concern, an absence of favouritism, appropriate task difficulty and a good measure of peer esteem. All these add up to create a good classroom climate. The teacher must care. Good teaching builds bridges to individuals.

Teacher Satisfaction

The persistent work needed to create teaching excellence is more likely to be produced by a teacher who is high in satisfaction. *Satisfaction* is the source of motivation to continue to do the many routine but necessary tasks that are required for good teaching. This includes careful marking, detailed record keeping to monitor progress, thoughtful planning of curriculum, and thorough preparation of lessons.

A reasonably satisfied teaching staff is a critical component in any attempt at school improvement. While there are other important factors - both structural and individual - schools are not likely to be improved if there is pervasive dissatisfaction amongst the teaching staff. It is not necessary to argue that we ought to provide satisfying working conditions for teachers; the importance of worker satisfaction has in recent years been widely recognised in industry where there have been major changes to promote more agreeable working patterns. Worker satisfaction is a major contributor to greater industrial output. How much more important is a satisfied workforce when the output is the education of the next generation? Teachers, like other workers, are entitled to as satisfying a workplace as can be provided.

Furthermore, the difficulty of finding enough teachers and the high turnover of teachers in some areas gives a particular urgency to the consideration of teacher satisfaction. If teaching is to appeal to young graduates it needs to be seen as a satisfying and human activity. Many young people say the most important consideration in choosing a line of work is the need to obtain satisfaction. Satisfied workers are less likely than dissatisfied ones to seek other employment. Strenuous efforts to recruit new teachers for positions that cannot be filled make little sense without equally strenuous efforts to hold those who have been recruited by ensuring they are content with their work. The relatively low salary levels of teachers and the difficulty of matching the financial inducements of private industry makes it the more critical to enhance the appeal of teaching, as a desirable profession, by providing work circumstances that are as satisfying as possible.

Sources of Teacher Satisfaction

While wages have some importance (teachers need to receive a fair wage, set by comparison with similarly trained professionals) teachers have deeper sources of motivation which must be understood and tapped. In a recent study we asked teachers to indicate their level of satisfaction (on a five-point scale from very low to very high) and then give reasons for their level of satisfaction. We found the most prominent source of teacher satisfaction, in early career, is *relationships with fellow staff*. One teacher with fairly high satisfaction said, 'I feel I have become a valued member of staff. I gauge this from the reactions of colleagues and superiors'. Another explained her very low satisfaction: 'My *only* reason is the lack of support, communication and supervision I am receiving from the senior executive'.

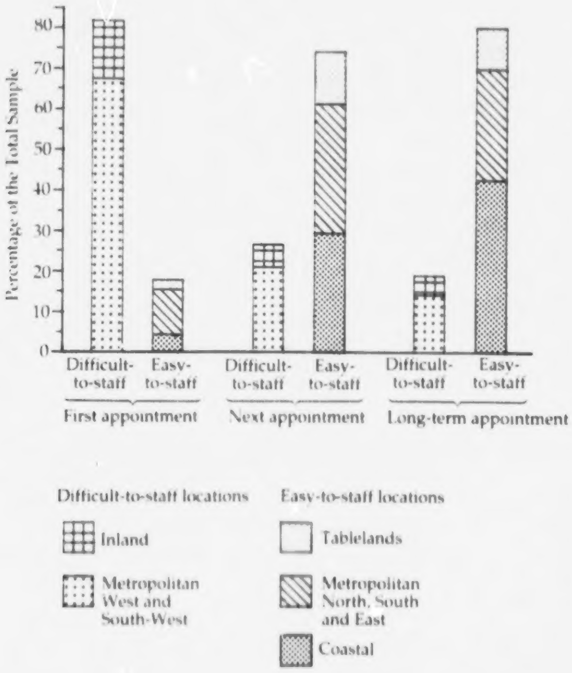
Almost as frequently, teachers say their level of satisfaction depends on their *pupils*. As one teacher put it, 'The children are my incentive and my reward.' If the children are co-operative and make good progress that strengthens satisfaction; if they are difficult and disrespectful that weakens it.

Amongst other reasons given for satisfaction, it is notable that we found very few mentions of *relationships with the community* and when the community was mentioned, it was often with a negative remark. The local community, given opportunity, could play a much more influential role in its relationships with teachers and so contribute more to the quality of education.

Staffing Stability

A striking finding of our research is that not all schools have the kind of conditions that promote teacher satisfaction. Teachers have strong preferences for some locations and seek to leave other areas as soon as possible. The

First Teacher Appointment and Future Preferences
Primary (611)



graph showing the first location of teachers, where they would like to be next and where they hope to be in the long term, gives dramatic evidence of this point.

In their first appointments, 82 percent of NSW primary teachers were sent to areas difficult-to-staff. (Metropolitan West/South-West and inland). For their next appointments, only 27 percent wish to be in these locations and in the long term only 19 percent wish to be in such places. A similar pattern is true for secondary teachers. As local recruitment increases and schools compête for staff it is clear that they do not compete on a level playing field. This means that in the difficult-to-staff schools there is always a high turnover of staff and a large proportion of the least experienced teachers. The challenge for the government as it allows or encourages local decision-making, is to give sufficient support to the difficult-to-staff schools with their high staff turnover, (and often socio-economic disadvantage) to offset the adverse educational effects which competition for staff can bring.

High levels of teacher turnover have serious consequences for schooling. Costly to the system and an extra drain on senior staff, excessive teacher turnover makes staff, student and community relationships more difficult to maintain and efficient school management harder. High teacher turnover may be interpreted by the community as rejection. Teachers in general may be seen as uncommitted 'tourists', 'blow-ins', unsympathetic to local life and culture.

Of greatest importance are the effects on the pupils. Research suggests a negative relationship of teacher turnover to pupil achievement. Even pupil self-concept can be adversely affected. When the Principal of that school with high staff turnover was told that teachers never come back after Christmas, she asked, 'Why?' 'It's us kids, I suppose', was the response. 'Cause we're naughty.'

The Commonwealth Schools Commission report, *Schooling in Rural Australia* (1988), argues that increasing teachers' length of stay 'is an essential condition for improving the quality of teaching in remote schools'. It is likely that a similar effect would be felt in any school where teacher turnover is high and length of stay is short, for example, in Sydney Metropolitan West.

Furthermore, experience (especially the first few years) is likely to improve the teacher's competence. A more experienced staff in general will be a more competent staff. Of course there are times when teachers should move. Too long in a school often produces professional stagnation. But in the difficult-to-fill locations we need a *staying-on* programme for teachers.

Improving Staffing Stability

Since the effects of rapid turnover are generally adverse and the quality of education is not likely to be improved without greater staff continuity, our research examined teacher reasons for remaining in an appointment. Of all the reasons for remaining, acceptance by the community was very important for both primary and secondary teachers. For **primary teachers,** if there was community acceptance, good accommodation and cultural facilities then teachers were likely to stay. For **secondary** teachers, the support they receive from the principal and staff and the levels of stress they are under will most reliably predict their length of stay. However, community items, quite similar to those nominated by their primary colleagues, also appeared prominently in the list. For secondary teachers, a perceived lack of parental support for education has a marked negative effect on their desire to stay on at a school.

The Community and School Improvement

When evidence on teacher satisfaction and staff stability are drawn together, there is a powerful message for the community.

Few teachers mention parents or the community as a source of their satisfaction, but acceptance by the community is a critical reason that teachers give for remaining longer in an appointment. The great untapped resource for raising satisfaction and so reducing teacher turnover is the community.

In the most important sense, teachers are responsible to parents for the effects of their work and they share with parents a very strong interest in the well-being (and foibles) of the children. Yet the line of responsibility from teachers to parents in public systems has been, and often still is, very long and indirect. We need to develop a sense of community ownership of the school. While parents have no say in things that matter at their local school (for example, in selecting the Principal, setting curriculum policy) a sense of community ownership of the school is unlikely to emerge. Without a clear identification of the community with the school, teachers are unlikely to develop a strong sense that they are working on the parents' behalf. This has been a major weakness of the strong centralised control of education which is being broken down now.

Current changes offer an historic opportunity for parents and the community to be a greater source of satisfaction to teachers. If public schools are to be improved, they need to boost the level of confidence which local communities have in them and to harness the energies and talents of the people in those communities for the benefit of the education of their children. This can be done at a range of different levels, from assisting in the classroom (for example, hearing children read), to serving on the School Council.

School Councils and Boards with significant powers can make a great contribution to the adjustment and stability of staff. For a school council to be successful, the parents and other community members must feel their contribution can make a difference beyond that which 'Parents and Citizens Associations' can do. Their powers need to include an input into the choice of Principal, the setting of general curriculum, and broad educational policy. Other responsibilities could include management and security of buildings, promoting interest in the school, and assisting in the provision of teacher accommodation. These three are matters over which there are major current problems that do not seem capable of solution without enlisting local goodwill and action.

Induction

A further avenue for community participation is in teacher induction. Induction refers to measures used to assist new teachers in coming to grips with the demands of the appointment. Induction may be informal (for example, an occasional chat over coffee) or formal (for example, a series of structured meetings). Our research found that those who are given an induction adjusted better and are much more likely to be satisfied. A formally planned induction was shown to be more helpful than an informal one. Only 12 percent of our sample received a formal induction, about 51 percent had an informal one and 37 percent had no induction whatever. What commercial business would train staff for four years largely at its own expense, then not make sufficiently thorough provision for their smooth transition into the workforce? In NSW, 1 in 5 quit teaching during the first two years. The lack of proper induction surely contributed to this unacceptably high teacher dropout rate.

As well as school staff, local community representatives should be involved in the induction programme. Typically, the inductions provided have not assisted in adjustment to the local community. A carefully planned introduction to the local scene - its educational aspirations, its social/recreational facilities and to some of its leaders - could overcome this limitation. Some good practical suggestions for setting up an induction programme are contained in McCahon and Carpenter's article in *The South Pacific Journal of Teacher Education*, No. 15 (1987). A positive early link with the community can make a profound difference to length of staff tenure as well as to teacher satisfaction.

Improving the quality of schooling in places difficult-to-staff will not be achieved by trivial means. It calls for great political will and long term effort. Furthermore, it needs an informed and persistent lobby to keep it on the political agenda. It must be achieved by the voluntary preference of teachers to stay for longer, principally induced by the quality of life-satisfaction they can attain through school and community.

Teachers who have good relationships with fellow staff and strong community links are much more likely to come back after Christmas!

Notes

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The full report of the research on which this ***set*** item is based is Watson, A.; Hatton, N.; Squires, D. and Soliman, I. (1989) *The Staffing of Schools and the Quality of Education: A Study of Teacher Stability and Mobility*. Sydney: NSW Ministry of Education.

For further reading on the topic

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Item 12

set research information for teachers
number one 1992

Senior Secondary School Courses

A Study of courses that provide diversity, involvement and success

Margaret Batten
ACER

COMMUNITY STUDIES
TRAD
STC
FULL ON
OK!
COOL
YEAH!
RIGHT ON!

EVERY YEAR more young people stay on at school. The reasons lie partly inside and partly outside the school. Job scarcity and the demands of employers for higher qualifications have influenced many young people to stay on at school past 15, and schools have made staying on more attractive by providing alternatives to the traditional academic curriculum in Years 11 and 12 (Forms 6 and 7). Over the last decade, in every Australian State, and in New Zealand, new subjects and courses to interest and benefit senior secondary students who do not plan to go on to higher education have been introduced. It was also hoped that students going on would take these new subjects too and thus broaden the focus of their studies.

Of course, there has not been unanimous support for these new developments, neither inside the schools nor in the wider community. You hear people saying 'Mickey Mouse subjects', 'falling standards' and 'lack of rigour'. So what evidence do we have, one way or the other?

The new subjects and courses have explored much broader and more varied curriculum areas than the mainstream curriculum - determined by university requirements - was able to provide. In addition, some of the subjects and courses have incorporated new approaches to learning and assessment that have changed students' attitudes to education from negative or neutral to positive.

Two notable examples are the Schools' Year 12 and Tertiary Education Certificate (*STC*) course in Victoria and *Community Studies* in South Australia. These two courses were developed from similar educational principles and beliefs. Their initiators were secondary teachers who felt strongly that the traditional academic curriculum of the time (the mid-1970s in one case, the early 1980s in the other) was failing to attract and benefit many senior secondary students, particularly those from low socioeconomic or non-English-speaking backgrounds. For both initiating groups, the major concern was to provide a Year 12 (Form 7) course that was not selective, nor competitive, nor externally controlled, and which matched closely the educational ideas of the teachers and the needs of their students. The *STC* course was started by a group of teachers in six high schools (mainly in inner-suburban, disadvantaged areas), and the *Community Studies* course by teachers in the Senior Secondary Curriculum Project (commonly known as 2S and jointly funded by the South Australian Education Department and the Commonwealth Schools Commission).

Within a few years of their inception, both courses had been accredited by state curriculum and assessment authorities as alternatives to traditional academic subjects and the successful completion of the new subjects contributed to the award of the Year 12 certificate.

Following accreditation, the number of schools and students involved in the courses increased rapidly. *Community Studies* was first offered as an accredited course in 1986, and by 1988 there were 94 schools with 347 classes taking *Community Studies* modules. The *STC* course was accredited in 1981, when 16 schools offered the course; by 1984, the number had grown to 42, and by 1988 to 117 schools, with 3200 students.

Two key principles of both programmes were student participation in the development of the curriculum, and goal-based non-competitive assessment. This involved co-operative learning, the incorporation of student experiences into the course, the integration of theoretical and applied knowledge, and commitment to the success of all students.

Community Studies offers a range of half-year modules, and students can take one or more, commonly in conjunction with other school-assessed or publicly examined subjects. The *STC* course is taken as a complete course, containing a range of subject options; *STC* subjects or units can not be taken in conjunction with other school-assessed or externally-assessed subjects.

The *STC* course, unlike *Community Studies*, and other alternative Year 12 programs in high schools, allows its graduates to proceed to higher education. In 1988, *STC* students gained admission to courses in all Victorian universities and other tertiary institutions. They could not get into Law and Medicine which required high numerical scores but could get into a great range of other courses such as education, business studies, art, engineering and nursing. In a typical year, about one-third of *STC* graduates go on to further education.

Educational Issues : Community Studies and STC Viewpoints

What evidence do we have that these developments are of real value and benefit to students? Critics attack both the principles and practices of the courses - they challenge the validity of the concepts of relevance, non-competitive assessment and a negotiated curriculum, they decry the lack of rigour, they question the emphasis on personal and social development, they express doubts about the status of the courses.

These criticisms are countered by data from teachers and students of the *STC* and *Community Studies* courses; further evidence comes from a research study of the *STC* course which I undertook at ACER from 1984 to 1987. Working in 14 schools, I surveyed and interviewed *STC* teachers, and monitored changes in students' perceptions of themselves and their post-school year. There were over 900 students in the sample, half of them from the *STC* course, the other half from the traditional academic (Group 1) course. The following paragraphs consider the evidence from these sources.

Relevance

In *STC* and *Community Studies* the work is intended to be relevant to the past experiences, present interests and future needs of the students.

Two examples illustrate how this works in practice. One student hoped to gain direct entry to a Social Work course at university, for which she needed relevant experience, so she chose *Community Studies* as one of her subjects. The programme that was worked out for her enabled her to observe, participate and report on the management and operation of four different community groups. Another student had won a prize at the beginning of the year for the plan he (and 3 others) submitted to the State Schools Nurseries for the development of the school quadrangle. With the help of funds from the School Council, they were able to implement their plan as part of their *STC* subject, Science (which for them became Horticultural Science). They learnt, through theory and practice, about landscaping and about caring for plants; they submitted written assignments on allied areas such as plant identification and soil composition. By the end of the year, this student would be well equipped to become, as he wished, an apprentice gardener.

A former *STC* student commented on the ways in which her course was relevant to her plans for the future:

> *STC* ... gave me an opportunity to investigate all aspects of my chosen career, develop the skills I needed for further study, and study a topic in depth. ... I enjoyed the independence of gaining your own information and research. ... I achieved all my goals in *STC*, I gained entry into the course and institution that I had as my first preference.

Another kind of relevance is the linkage of learning to students' past experiences. Here is an example of how it can be done; sharing with a peer was an important part.

Margaret found that she had a 20-year-old girl from the Khmer Republic in her class. Margaret was worried about the student's difficulties with written language and wondered how Tuoi would complete the work required for Australian Literature and Society.

> Tuio found ways to help herself. She asked Margaret, as she dictated the story of her first days in Australia. Then she took this first draft to Lorraine, another girl in the class, who helped her just by asking questions or saying 'What does this mean?'.
>
> Lorraine's confidence as a writer burgeoned. She had never seen herself as a 'good' writer let alone as someone who could help others write.
>
> It was a pretty slow process, and demanded much of Tuio's persistence, but when she found out who could help her, and that the teacher was prepared to give her time, she was able to complete her story and publish it in the school's newspaper.

Negotiation and Student Participation

Some people dismiss the principle of a negotiated curriculum because they interpret it to mean that students can do what they like (with the implication that what students would like would not be 'real' learning). In practice the experience and expertise of all those involved is taken into account, as the *STC* handbook points out:

> The responsibility for broad, preliminary decisions about the content of a course and the way it will be conducted are still seen to rest with the teacher, and rightly so, whilst details of what exactly will be studied, how and when, remain within the group, of which the teacher is also a member.

STC teachers describe the reality of negotiation as a challenging and demanding process for both teacher and students:

> Negotiation is a bit nerve-racking for the teacher at the start. You feel much safer in an ordinary class. In *STC* you have to justify what you say, think more about what you do and why.

A former *STC* student commented:

> The *STC* course also prepared me for academic life in a tertiary school, as we also do a lot of negotiating and non-competitive assessments. We also have many discussions and debates in tutorials I find a lot of this similar to the *STC* requirements.

A teacher comments:

> *STC* really helped the introverted kids. In order to get good comments at the end of the year, everyone had to participate. At first it was really hard for some of the quiet kids, because they just weren't used to speaking up and joining in. ... by the end of the year they had really changed. Everyone learnt to listen and respect each person's opinions. They were made to feel just as important as each other class member and this really built up their self-confidence. Finally, they didn't feel stupid or awkward when they spoke out.

The following extract from Roger, a teacher in *Community Studies*, shows how students learn to take responsibility for their own learning.

Although some students were taken aback when asked

> to further their efforts in their community project they saw that their efforts may not satisfy the spirit of the work required. Students, together with their teacher, re-examined the work required and developed a range of options to give their projects greater depth ... This group gave themselves the opportunity to learn from their mistakes through trial and error.

Rigour

'Lack of rigour' is an accusation frequently made of courses that are different from the traditional academic courses. What is usually meant is that there are no external examinations and marks, and there is too little emphasis on theoretical work. However learning which is practically oriented and focuses on resources other than text books and using assessment methods other than examinations can be just as rigorous, demanding and challenging as the more traditional approaches to learning. One *STC* teacher said of his subject:

> The combination of *STC* and literature is a most satisfying and productive union. I know of no other subject that has the same fusion of intellect and feeling. I know of no other course which allows students the freedom to pursue their interests with intellectual vigour and sanctions their sensitivities and feelings so readily.

At one *STC* school, senior science has developed into two major areas: science & society, and science & technology. Some of the individual projects undertaken by students, which show a happy combination of theoretical and practical without sacrificing rigour, include:

- designing a low energy house;
- a plan to overcome environmental and dietary stress on the heart;
- designing an action plan for schoolground development;
- disease causes and prevention;
- the failure of the computer;
- designing an ergonomically sound computer classroom; and
- endangered species, past and present causes, possible solutions.

A comment from a member of the 2S team, reporting a conversation among team members, shows that, in order to estimate the rigour of a course for an individual student, one must be aware of that student's starting point in learning at the beginning of the course.

One of the teachers in the *STC* course felt that the type of rigour found in the course gave her a new stimulation and purpose in teaching:

> I believe that *STC* has enormous potential for developing appropriate courses for students. I believe that *STC* can provide rigour and I am now interested in the notion of challenging students' intellectual capabilities more than before.

Assessment

The assessment procedures used in *STC* and *Community Studies* are based on three key principles: assessment is an integrated component of the curriculum, reflecting the aims and objectives of the unit or subject and the range of learning experiences undertaken by the students; appropriate forms of assessment are negotiated between teachers and students; and assessment is non-competitive, taking the form not of grades or marks but of successful completion of the work that is required.

An extract from the *Community Studies* handbook shows the range of assessment procedures used in one of the modules, Small Business Management, all of which reflect the aims and objectives of the course (which are stated in the handbook although not included here).

> The work required will be negotiated as part of the moderation process using the following as examples:
>
> keep a detailed record of all practical activities for the whole module;
>
> design and build a model demonstrating
> the use of alternative energy
> conservation of energy, and/or
> increasing efficiency of energy use;
>
> design and carry out experiments as part of a group;
> present 2000 words of writing (drafts, edited and re-written to the satisfaction of the teacher and student) in the form of a report, essay and/or assignment possibly related to
> excursions
> work experience
> guest speakers
> relevant issues
> reports
> research and experimentation;
>
> actively participate in class discussion;
>
> address the class or another group;
>
> keep a file of alternative energy sources, trends and developments, predictions, research and experimentation in this area, including all the essential ingredients of the project.
>
> The details of the contract will be negotiated between the students, teacher, and the moderator, as part of the module.

Comments from a former Higher School Certificate student in Victoria show how restrictive the traditional competitive system of assessment was:

> In retrospect I found the current Year 12 course horrific. The subjects were not studied in any depth, learning was basically superficial. So much time was placed on getting through the set syllabus (which the students had no choice in) that learning became peripheral. The crux of the year came in November when all that was tested was your memory and how well one regurgitated material that the examiners required.

In contrast, two *STC* students describe the advantages of the assessment system used in their courses:

> ... During the course my only competition was myself and my determination to continuously improve my work which I feel I have done. My confidence, independence and responsibility have been brought out during this course, which I feel will help me in future years. I feel I am now ready for the workforce.

> I did not want to compete with my fellow students but to work at my own pace. Also I wanted to slowly see my improvement during the year and compare 'me' at the start of the year and at the end of the year.

The teachers that were interviewed as part of the research study of the *STC* course had a lot of positive things to say about the assessment procedures used in the course:

> These assessment techniques provide the basis for self-awareness and improvement.

> Students must be given the opportunity to have successful learning. Grading invariably puts someone at the bottom.

> One is able to place value on learning modes not recognised by traditional assessment techniques, e.g. discussions, oral work, group work.

Personal and Social Development

At the end of Year 11, (Form 6) students from the traditional academic course and *STC* students had similar views about the importance of personal, social and career development in their next year at school. But, by the end of Year 12, academic students felt that their course had failed to live up to their expectations whereas *STC* students felt their course had provided well for these aspects.

The greatest differences were in the development of self-confidence and independence, the application of learning to real-life situations, being able to follow your own interests, and the acquisition of skills and knowledge needed to get a good job. At the end of Year 11 (Form 6) the self-esteem of *STC* students was significantly lower than that of academic students, but by the end of Year 12 the self-esteem of *STC* students had risen so much that it was significantly higher.

There was support for this finding from another part of the study, which involved questionnaires to and interviews with *STC* teachers. These teachers repeatedly commented that one of the most important outcomes of the course for students was the development of self-confidence:

> The growth in self-confidence is enormous and appears to be a necessary consequence of anyone undertaking an *STC* course.
>
> The most spectacular area of improvement in my students.

This sense of confidence in themselves and their abilities was carried through by *STC* students into their first post-school year.

> The *STC* course really boosted my self-esteem and made me more socially active and involved. I felt a great sense of success (within myself) and my accomplishments were recognised once I was accepted into a tertiary institution. I didn't feel inadequate as the Group 1 (academic) course made me feel. For once in my academic life, I felt like an equal!

Community Studies modules generally formed only part of a student's Year 12 course, but they were planned to equip students with a range of skills that were not just academic. As one of the developers of the courses said:

> The methodology underlying Community Studies courses has given students a chance to develop the skills they have been asking for ever since I began my career in education. These skills are in fact the skills I wanted to develop in my final year of schooling - the useful skills - those that could be translated into many areas of life.

A Concluding Comment

One criticism that is made of courses such as *STC* and *Community Studies* is that the courses and their graduates will be seen by the general public as not just different from, but inferior to those from mainstream courses. That is the reason that the *STC* course is being phased out in Victoria; the new VCE courses and certification, based on a rationale of equality, are intended to do away with such discriminations.

The danger is that, no matter how good the intentions of the developers of the new courses, the marginal students (those that were uninspired by and unable to cope well with the old mainstream courses) may once again be swamped by the curriculum preferences and achievements of the more orthodox academic students and therefore may be disinclined to stay on to complete their secondary schooling.

While the objections to a two-tiered system are valid, they can in part be countered by the success stories of *STC* - the thousands of young people in satisfying jobs and tertiary courses of their choice who would not have been there if it had not been for the *STC* course. To those young people (and to their employers and lecturers), the concept of a 'second class' course is irrelevant because their Year 12 course has opened professional and personal doors for them which might otherwise have remained closed.

The Australian Federal Government set a goal of 65 per cent of children staying on at school to Year 12, (Form 7), by the early 1990s, a target that was achieved earlier than anticipated. It has recommended that new curriculum approaches make the final years of secondary education more attractive and relevant to a wider range of young people. In the report *Skills for Australia* the Federal Minister for Employment, Education and Training said that as well as aiming for a high quality basic education in the core disciplines of language, mathematics and science,

> we also need to examine new ways to impart the less measurable skills on which future prosperity depends - life-time learning, enterprise and initiative, pursuit of excellence, communication skills, teamwork and responsibility.

These are the skills that courses such as *STC* and *Community Studies* have been able to impart to students, as demonstrated by teachers, students and researchers. Policy-makers and curriculum-developers in post-compulsory education would do well to ensure that the principles exemplified by *STC* and *Community Studies* are incorporated into courses they develop for students in the 1990s.

Notes

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The quotation from the Australian Federal Minister for Employment, Education and Training is
Dawkins, J.S. and Holding, A.C. (1987) *Skills for Australia*. Canberra: AGPS.

The material used in this article, and more information about the two courses, can be found in the following publications:

STC

Batten, M. (1989). Year 12: *Students' expectations and experience* (ACER Research Monograph No. 33). Hawthorn, Vic.: ACER.
and
Freeman, M. (1987). *One for all: designing a universal, comprehensive and challenging senior curriculum*. Canberra: CDC.
and
VISE (1985). *Approved Study Structure V: STC Course*. Melbourne: VISE.

Community Studies

Senior Secondary Curriculum Project (1987). How to ...? *Implementing alternative curriculum in secondary schools*. Wattle Park, S.A.: Wattle Park Teachers' Centre.
and
Senior Secondary Curriculum Project (1987). *Looking back: 1980-1987, looking beyond 1987 ...* (Network Newsletter No. 5) Adelaide: Education Department of South Australia.
and
SSABSA (1985). *Community Studies: Year 12 detailed statement*. Adelaide: SSABSA.

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From Secondary School to Work in Japan

By Kaori Okano
La Trobe University

TRANSITION FROM SCHOOL to work is pretty haphazard in New Zealand and Australia. Other countries organise transition tightly and organise it differently. Different may not be better, but with unemployment a major problem in Australia and New Zealand, our system of exams of doubtful *educational* worth, and the system of entry to tertiary study hardly fair to minorities, it is worthwhile examining different systems. Here the Japanese system is explained.

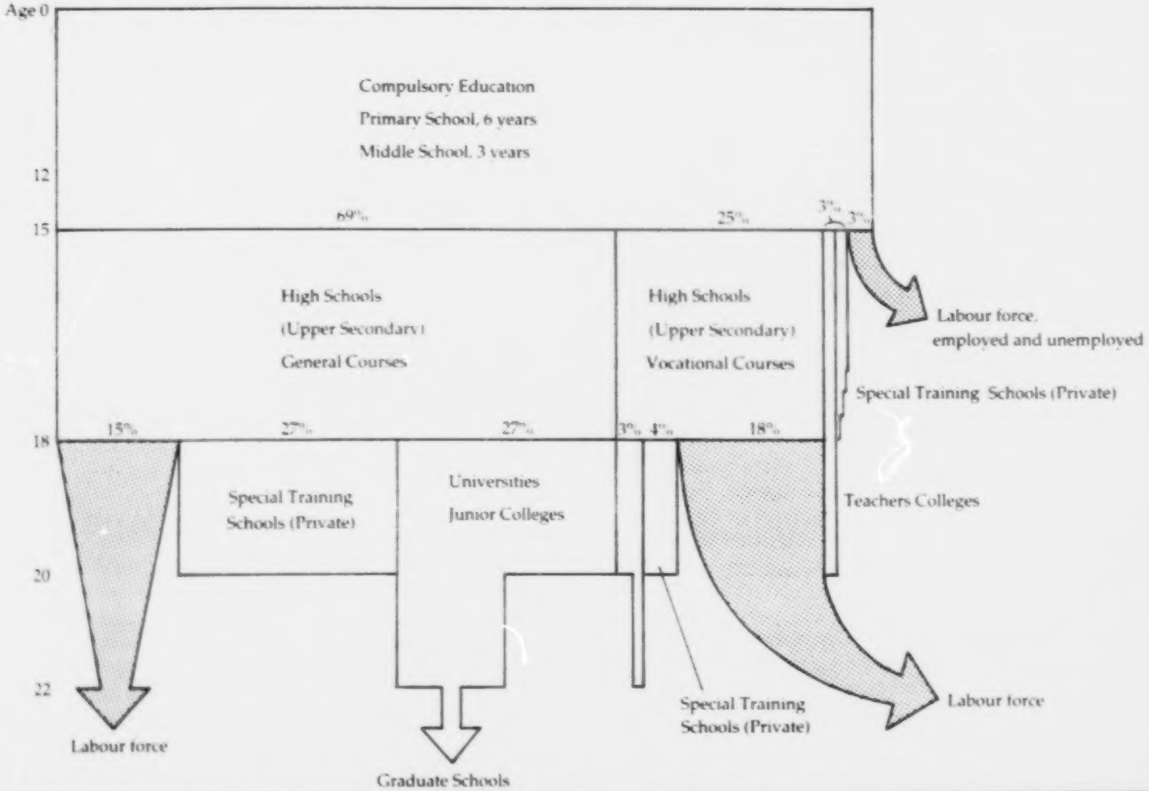
Senior High School Leavers Seeking Employment

In Japan children have 9 years compulsory education plus 3 years senior high school. Thus young people going straight into jobs are 18 years old, slightly older than the youth considered at risk in Australia and New Zealand.

The 'school ladder' diagram shows that 93.9% of 15-year-olds go on to senior high school and almost all complete the high school diploma. Students find an advantage in staying on until the end of schooling, since **the school takes the responsibility for finding appropriate employment for them.**

Senior high school offers two kinds of curriculum orientation; a *general* (academic) course and a *vocational* course (for commerce, industry, agriculture, home economics, fishery, nursing and others, available in order of enrolment numbers). These two courses are offered in separate schools, with a few comprehensive arrangements. In 1987, 73% of the total senior high school students were enrolled

Figure 1 *Japanese School Ladder* 1987 figures; all are rounded percentages of the total intake.


Age 0
12
15
18
20
22
Compulsory Education
Primary School, 6 years
Middle School, 3 years
69%
25%
3%
3%
High Schools
(Upper Secondary)
General Courses
High Schools
(Upper Secondary)
Vocational Courses
Labour force,
employed and unemployed
Special Training Schools (Private)
15%
27%
27%
3%
4%
18%
Special Training
Schools (Private)
Universities
Junior Colleges
Teachers Colleges
Special Training
Schools (Private)
Labour force
Labour force
Graduate Schools

in the general course (Japan, Ministry of Education, Science and Culture, 1988:44-5).

In some school zones, senior high schools form a clear prestige hierarchy based on the relative difficulty to get in. In other zones local education boards have taken steps to eliminate inegalitarian selection and no hierarchy exists; students scoring a certain level in the common examination are randomly assigned to schools. Vocational schools rank below general schools in the public's eye.

The lower status of vocational courses is partly due to the relative ease in gaining admission, and partly because of the career patterns which leavers follow. Seventy-one percent of vocational course leavers directly entered employment in comparison with only 22% of general course leavers. A top school in a hierarchical zone sends 100% of its students to universities, and, in particular, more students to prestigious ones. The Chart shows the distinctive patterns of first destination of leavers from general and vocational courses.

Students of vocational courses do not encounter institutional constraints in applying for admission to universities, and a small proportion of them (10%) in fact do enter universities. Nor do students of general courses who immediately take a job, experience disadvantage, since employers, especially large ones, do not consider the specific occupational preparation as important. They are concerned with a recruit's potential for development rather than with immediately useful skills.

Having said that, it is clear that where you go to senior high school does have a narrowing effect. So the decision to pursue one curriculum course rather than another at the end of compulsory schooling is the first key occupation decision for most Japanese youth.

It has been claimed that the decision about which high school you go to is based on your academic achievement and homeroom teacher's advice at junior high school, and that the system is meritocratic. Some vocational senior high schools have low levels of morale because some of the students ended up there not by their own choice. The influence of family background is also significant. Students from privileged families, for instance, find their way to high-ranking schools, whilst those from disadvantaged families go to low-ranking vocational high schools.

The Last Year of Senior High School: Job Referral System

The transition process has no 'sudden break' and both employers and schools are actively involved in the process together. Symbolic ceremonies are organised to mark students' entry into the workforce, as a clear step into adult status in their minds. These are school graduation ceremonies and company entry ceremonies. But school and employers, throughout the transition process, closely supervise the young people.

Most students have been accepted by an employer 5 months before leaving school. For those without jobs the senior high school has a responsibility to search for employment for 2 months after they complete school. Schools monitor their leavers at work both for the well-being of the leaver and to help give advice to next year's leavers who may want to apply for positions at the same place.

Placement of senior high school leavers involves four parties: school, the Public Employment Security Office (PESO), employers and students. The school's role is particularly significant. This is in part due to legal regulation.

The Labour Law of 1947 strictly prohibits teenagers having direct contact with prospective employers. The law states that employment exchange services for teenagers can be supplied by the PESO directly and by non-profit making agents such as schools. This is to prevent negotiations which may be unfair to the youth whose knowledge of the world and whose skills to handle employment contracts are still immature.

School, the PESO and employers participate in the students' transition process with 'mutual trust' and coordination. However, each party pursues its own interest.

The school's interest lies in sending out as many leavers to prestige firms as possible. The school looks for firms known for better working conditions, both for the benefit of students, and for the school so that its reputation as a good school will attract higher quality students. Through the schools' internal selection, school career teachers send the best students to the best employers in the area. This meets the expectations of the employers, and the school will be asked to find a larger quota for the employer in future. Due to this close link between school and employers, new schools struggle to establish contacts with firms often sending teachers to them in public relations visits.

The PESO, a non-profit organisation, is responsible for mediating between job-seekers and employers for all age groups. However, due to the sheer number of senior high school leavers intending to obtain employment, placement responsibility is generally borne by the schools. The PESO's main involvement is to examine working conditions and give an approval stamp to recruitment cards. The cards are brought in by employers before being sent to school. This is to avoid youth labour exploitation. Other than this, the PESO usually just provides relevant information on request, to the schools.

Employers are interested in maintaining their reputation in order to attract the best applicants. Just like schools, they are competitive. They make new-leavers'-hiring-plans one year ahead; they fill in recruitment cards to be approved by the PESO; they send the card to selected schools; and they conduct screening examinations. Long-term personnel planning is necessary for this type of practice. This applies both to large firms and department stores, and to small factories and shops, since employers believe that they can get better applicants through school channels than by other means. Most Japanese farmers operate at a small, family, scale, without employees and do not rely on the job referral system.

Competition, both between schools for better employers and between firms for better students, is not open slather. It is alleviated by agreement on such matters as the date when employers can start sending recruitment cards to schools; the date when schools can send students' application forms to employers'; by the 'one-company-at-a-time' practice (as will be taken up later); by the date when employers can start their screening examinations.

A Typical Calendar

The Japanese academic year starts in April and finishes in March. Leavers commence working in April.

In **March-April**, employers formulate hiring plans for the March leavers of the following year.

The key player at each school is the Department of Guidance for Life After School (called DGLAS here). The DGLAS comprises several full-time teachers and provides assistance for students making the transition to either employment or further education. DGLAS teachers have classroom teaching to do in their own subjects, about 15 periods out of 34 per week, just like other teachers at Japanese senior high schools. However, they are exempt from being homeroom teachers.

In **May-June**, employers explain the plans to the PESO in their area and fill out the officially prescribed recruitment forms.

Also in **May-June**, the DGLAS at each school organises a meeting for intending leavers and their parents on the prospects of the job market. Later there will be three-party meetings on an individual basis for each student. At these the student discusses, with his or her parents and homeroom teacher, plans for life after school. Last year's leavers, now in employment, are called in to give a talk.

In **July**, the completed recruitment cards (RCs) are submitted to the PESO for approval, and the approved RCs are mailed to the targeted schools. Employers are now allowed to visit schools with the RCs, but only to meet career teachers and students in groups, due to the legal regulation.

In **July**, examining RCs, students make more realistic decisions on a particular company and consult their homeroom teachers. Schools then invite students to internal screening application.

In **August**, during the summer holidays some firms allow schools to organise a group of interested students to inspect the firm. The employer sees these visiting students, and the DGLAS teachers can informally find out whether they will have a good chance to be successful in the final screening. If the company's response is negative, the DGLAS teachers still have time to suggest that the student try another firm well before the September testing season starts. For visits, firms and schools have a strict 'one-company-at-a-time' agreement.

In **late August** each school conducts internal selection to decide which students are to try each particular company's screening examination, that is, if the positions the students have decided on are appropriate. There are also cases where more students apply to join a firm than the number the firm is asking for, from that school. This involves DGLAS teachers and students' homeroom teachers; in some cases, students talk it out among themselves. Criteria are: academic performance, school attendance, extra-curricular club participation, and personality, although the weighting of these criteria depends on the kind of job, and the firm in question. Through the internal selection, the individual student's decision becomes the school's decision also.

In **September**, schools send the application papers to employers, and start lessons and practice sessions for job interviews. Here too a 'one-company-at-a-time' agreement is practised to avoid the confusion resulting from one student being offered more than one position.

In **mid-September**, employers conduct screening tests, often consisting of Japanese essays, general knowledge and maths at the first stage, and interviews at the second stage.

In **early November**, when students are still at school, orientation sessions are conducted by the companies for those students to whom they offered jobs.

By **mid-November**, a majority (95%) of students seeking employment have been employed by a firm, some of them having attempted third or fourth round examinations by then. Due to the 'one-company-at-a-time' agreement, by the time of the second round of examinations, the prestige of firms available to choose from drops considerably. This is why internal selection by school is very important. The career teachers accumulate data on the students' school record and on the companies for which he or she applied in order to make the most studied decision.

The schools continue job-searching and placement until every student obtains employment. Students complete school and leave in March. By this time it is difficult to find suitable jobs but the school is still responsible for those students for 2 months further.

At times of economic down-turn (for instance, the mid-1980s, when Japanese heavy industries suffered) schools face difficulties in securing enough jobs for their students. The DGLAS teachers vigorously visit the companies with which they have maintained long-term relations, as well as unfamiliar companies. They ask them to create employment positions. At such times companies often reduce all of their employees' wages, not only in order to keep present workers in employment, but also to continue recruiting new workers so that they can maintain healthy relations with the schools for the long-term future. In times of labour shortage, companies know they may have to rely on schools' good will.

Discussion

At first glance, these pragmatic job search and placement arrangements appear to facilitate smooth transition for school leavers. Three parties, school, the PESO and employers coordinate their roles so that each party achieves that to which it aspires. At the same time, a majority of students are assured a job well before they leave school. It seems very efficient.

However, the students are perhaps unduly protected, are forced to be dependent, and are overcared-for by the three parties (including employers) and perhaps by adults in general. They are still considered 'immature' and in need of special attention. Employers do not welcome dependent employees but are prepared to accept them and assist their development.

This view of high school leavers is manifested in the labour legislation which prohibits recruiters meeting students individually. Treating high school leavers as only 'semi-adult' is also observed in other practices. For example, employers get leavers and their guardians to sign tentative agreements to accept the employment offers. Also, parents take a large part in a grand 'rite of passage', a ceremony for new employees' formal entry into the firm. No such protective or paternalistic treatment is observed in the transition from tertiary institutions to work. Students in the last year of tertiary education are assumed to be fully grown individuals capable of legally binding business transactions on their own behalf, and can do anything in search of jobs, while employers are free to work on them individually. There are certainly differences in expectations of senior high school leavers and adults.

The period of childhood seems to be much longer for Japanese than for Australians and New Zealanders. Japanese society allows a substantially longer period of semi-adulthood as an extension of dependent childhood. Besides the length of childhood, Japanese society has its own priorities and conventional formulations of what adolescence is and should be. While Americans believe that adolescents mature through experience, choice and judgement, which requires freedom, and are prepared to pay a price for misusing freedom, Japanese see maturation centering on the process of integration into the larger society, from being a member of a family, to being a member of a school, to being a member of a work organisation, to being a parent. At what point of life one is considered 'an adult' is a culturally relative matter, and what constitutes 'maturity' differs across cultures.

The smooth transition prevents youth traumas that result from initial maladjustment and/or unemployment. It contributes to the maintenance of social stability and morale. Are these leavers happy in these institutional arrangements, being looked after well, having less autonomy than their New Zealand or Australian counterparts? I found from my fieldwork that, in general, the students appreciated the caring and protection aspects of the job referral system more than its elements of control. The majority of them preferred being protected students to becoming workers.

Another feature in the transition process is that the family's direct influence on children is limited. Because the job referral system operates through the close school-firm link, there is little room in which families can manoeuvre in their human network (social resource) and wealth (economic resource) in favour of their children. For over 75% of senior high school leavers' employment is arranged through a combination of school career office and the PESO. Some students do find a job at a relative's office, but even in this case, the company tends to go through the formal or 'proper' procedure of preparing recruitment cards, obtaining approval from the PESO, and letting the student submit a formal application. This is because a 'properly' acquired position has a higher value in the public's eye.

The whole school leaving system may be considered 'meritocratic'. The screening is almost completely based on students' achievement and family influence is minimised. This is true of all Japanese schooling. Admission to senior high schools and universities, is solely based on one-shot examinations. Meritocracy also allocates the academic bottom half of the age group to unpopular, less well paid jobs through the system I have been describing. In this way, the system may be utilising available human resources effectively for the collective societal and economic needs of a nation. In this regard, the system is effective. But is this type of meritocracy 'equitable'?

The system provides 'equity' for students from disadvantaged families. There is no equity for them if families can directly influence children's employment through class, lineage and other ties. It is always the privileged families, not the disadvantaged, who can exercise their power in favour of their children. Under the job referral system, schools compete between themselves in pursuit of better employers for their students, while employers compete for better new recruits from school, leaving little room for family influence. Students from powerful families claim that the system is not equitable since individual's free choice is limited. But, if there is no system only certain groups of people do have a choice.

However, meritocracy has its failings. In theory, a meritocracy offers equal educational opportunity, makes it frankly competitive, and then uses the order of merit produced to stratify individuals according to the many grades of work in society. But this is not equity. Firstly, what constitutes 'merit' is determined by the society's dominant culture. Secondly, merit, (academic achievement in this case) is not just a product of individual ability and effort at one point of time. Starting conditions are different. Academic achievement and personal qualities result from a mix of factors: the family's material condition (economic resources), its history and interests (cultural resources), its human network, (social resources), and, as well, the individual's effort. Since academic achievement (measured by 'objective' examinations) is the most important merit in Japanese meritocracy, most Japanese families concentrate on turning their economic, cultural and social resources to helping their children's academic achievement.

Another question relating to 'equity' is that individual students are evaluated on the basis of the *school* they belong to. Their individual qualities do not count very much. Employers assign a certain number of positions to a school through their established link with the school. This is based on the performance of previous years' employees from the school, not on the qualities of this year's leavers. Further, schools make decisions on who will attempt a firm's final screening test through internal selection within the school. Both employers and students appear to trust the school's decision, but its fairness could be sometimes doubted.

Concluding Remarks

Japanese high school students experience the transition from school to work, closely supervised by adult-run institutions, namely school, the PESO and employers. The institutional criteria are meritocratic, and subsequently 'efficient' for the collective needs of Japanese society. However, the question of 'equity' is not addressed. The responsibilities and the choices made in transition to work are determined by institutions rather than by young adults themselves.

Notes

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The way many high schools are arranged in a hierarchy of difficulty of entry is examined in

Rohlen, T.P. (1983) *Japan's High Schools*. Berkeley, University of California Press.

The way the law protects high school leavers from exploitation is detailed in

Horvath, P. (1982) *Career Counselling for Non-college Bound High School Seniors in Japan.* Washington DC: US Department of Education Office of Educational Research and Improvement (OERI). (Most readily available on microfiche; please quote ED 271 404.)

and

Taira, K. and Levine, S.B. (1986) *Education and Labor Force Skills in Postwar Japan. Final Report.* Washington DC: US Department of Education Office of Educational Research and Improvement (OERI). (Most readily available on microfiche; please quote ED 271 399.)

The School's interest in attracting prestige firms for its leavers, and for its own reputation, is discussed in

Umetani, S. (1985) *Occupational Information, Placement and Choices for the Japanese Youths.* Washington DC: US Department of Education Office of Educational Research and Improvement (OERI). (Most readily available on microfiche; please quote ED 371 401.)

The one-company-at-a-time agreement is also discussed in Umetani's paper.

The ceremony of entry for new workers in a firm is described in Taira and Levine, referenced above.

The differences between Japanese and American adolescence are discussed in Rohlen, referenced above.

A useful reference to the process of leaving high school for work in Japan is

Evans, R.Jr (1986) *Vocational and Occupational Training of Non-College Bound Youth.* Washington DC: US Department of Education Office of Educational Research and Improvement (OERI). (Most readily available on microfiche; please quote ED 271 403.)

A full treatment of education and equality in Japan, including meritocracy and one-shot exams, is

Cummings, W.K. (1980) *Education and Equality in Japan.* New Jersey: Princeton University Press.

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A Great Waste of Talent

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Human Capital Theory and Educational Policy

A BASIC TENET OF HUMAN CAPITAL THEORY is that education is a commodity like any other and that knowledge is a private good which can be purchased like any other. It follows that individuals should pay a significant proportion of their own educational costs.

In New Zealand, recent governments have followed policy paths which appear to be consistent with human capital theory. For example, the fourth Labour government introduced fees to tertiary institutions on the human capital theory assumption that students would see the advantages in monetary and status rewards that a tertiary education can offer and so would overcome the financial barriers posed by the introduction of fees. Likewise, the present National government's Study Right policy assumes that students will be prepared to borrow money to gain a tertiary education because of its attendant monetary and status rewards. Both governments have assumed that the material pursuit of self-interest can overcome the financial barriers posed by fees. But will it?

In an attempt to answer this question we calculate figures on the wastage of talent in the school system using data from the Christchurch School Leavers Study. These figures show that there were substantial inequalities in education between the different socio-economic status (SES) groups *prior* to the introduction of 'New Right' thinking in education policy. Even before the introduction of user-pays measures, there was a massive wastage of talent as lower SES pupils failed to gain the qualifications attained by their higher SES peers of equal ability.

An Estimate of the Level of Wastage Before User-Pays

In the Christchurch School Leavers Study, data were gathered on the scholastic ability, socio-economic status and academic achievements of all pupils leaving 20 Christchurch secondary schools in 1982. After students with missing data were excluded, the final sample comprised 2753 students. Briefly, the variables were:

(1) Measured ability. All available test scores on 'intelligence' tests and tests from the PAT series were converted to an IQ equivalent (called DIQ) and the mean score calculated.

(2) Socio-economic status. The Elley-Irving (1976) scale was used with the addition of a category to cover those not in receipt of a wage, such as the unemployed and beneficiaries.

(3) Academic achievement. Successes in all the secondary qualifications such as School Certificate, University Entrance, etc. were recorded. (These qualifications are described in the **Notes** section)

In the subsequent analysis these variables have been treated as follows:

(1) Students have been designated as having high ability if their mean DIQ equivalent was 112 or above, and low ability if their mean DIQ equivalent was 93 or below. These cut-off points approximately divide the top 25 percent and the bottom 25 percent from the remainder of the sample.

(2) Students have been combined into three socio-economic groups.

Group 1 comprises Elley-Irving categories 1 and 2 – that is, professional and managerial occupations.

Group 2 comprises the Elley-Irving category 3 – that is, clerical and office occupations.

Group 3 comprises Elley-Irving categories 4, 5 and 6 – that is, skilled, semi-skilled and unskilled blue collar occupations – plus the unwaged.

(3) Academic achievement has been divided into nine categories. (The qualifications are described in the **Notes** section at the end of the item.)

Table 1 shows the academic achievement of the 1982 School Leavers by SES group.

Table 1

Academic achievement by SES group (percentages in parentheses)

	SES group		
Achievement category	**1**	**2**	**3**
1 No qualifications	85 (10.9)	116 (17.0)	459 (35.6)
2 1 or 2 passes (SC, SFC)	32 (4.1)	57 (8.3)	138 (10.7)
3 3 or 4 passes (SC, SFC)	38 (4.9)	54 (7.9)	134 (10.4)
4 5 or 6 passes (SC, SFC)	37 (4.7)	46 (6.7)	80 (6.2)
5 7+ passes (SC, SFC)	70 (9.0)	76 (11.1)	114 (8.9)
6 UE	192 (24.6)	174 (25.5)	228 (17.7)
7 HSC	84 (10.7)	60 (8.8)	39 (3.0)
8 Bursary	226 (28.9)	92 (13.5)	93 (7.2)
9 Scholarship	18 (2.3)	8 (1.2)	3 (0.2)
Total	782 (28.4)	683 (24.8)	1288 (46.8)

The differences are obvious and striking. While 35.6 percent of those from SES Group 3 left school without qualifications only 10.9 percent of those from SES Group 1 were similarly completely unsuccessful in the examination system. Conversely, 31.2 percent of the SES Group 1 students got a bursary or scholarship while only 7.4 percent of the SES Group 3 students did.

Do these differences disappear if we control for ability? To answer this question the data in Table 1 have been broken down by ability, giving three further tables for high, average and low ability groups. Table 2 shows the academic achievement by SES Group for the high ability students.

Clearly the able students from SES Group 3 homes were grossly disadvantaged when compared with their Group 1 counterparts. While just under a quarter (24.4 percent) of Group 3 students gained a Bursary or Scholarship well over half (57.5 percent) of those from Group 1 attained these qualifications. At the other end of the achievement scale, 6.7 percent of those from SES Group 1 homes left without UE compared with 34.2 percent of those from SES Group 3 families. The same pattern is shown in Table 3 for average ability students and Table 4 for low ability students.

Table 2

Academic achievement by SES group for high ability students
(DIQ equivalent 112+) (percentages in parentheses)

	SES group		
Achievement category	**1**	**2**	**3**
1 No qualifications		6 (3.4)	9 (4.2)
2 1 or 2		2 (1.1)	5 (2.3)
3 3 or 4	5 (1.6)	7 (4.0)	23 (10.8)
4 5 or 6	5 (1.6)	4 (2.3)	14 (6.6)
5 7+	11 (3.5)	12 (6.8)	22 (10.3)
6 UE	79 (25.1)	63 (35.6)	77 (36.2)
7 HSC	34 (10.8)	20 (11.3)	11 (5.2)
8 Bursary	164 (52.1)	55 (31.1)	50 (23.5)
9 Scholarship	17 (5.4)	8 (4.5)	2 (0.9)
Total	315 (44.7)	177 (25.1)	213 (30.2)

Table 3

Academic achievement by SES group for average ability students
(DIQ 94-111) (percentages in parentheses)

	SES group		
Achievement category	**1**	**2**	**3**
1 No qualifications	36 (9.8)	32 (9.2)	140 (22.0)
2 1 or 2	21 (5.7)	36 (10.4)	82 (12.9)
3 3 or 4	25 (6.8)	26 (7.5)	86 (13.5)
4 5 or 6	24 (6.5)	28 (8.1)	55 (8.6)
5 7+	50 (13.6)	53 (15.3)	73 (11.5)
6 UE	104 (28.3)	101 (29.1)	132 (20.8)
7 HSC	47 (12.8)	37 (10.7)	26 (4.1)
8 Bursary	59 (16.1)	34 (9.8)	41 (6.4)
9 Scholarship	1 (0.3)		1 (0.2)
Total	367 (27.2)	347 (25.7)	636 (47.1)

Table 4

Academic achievement by SES group for low ability students
(DIQ equivalent 93-) (percentages in parentheses)

	SES group		
Achievement category	**1**	**2**	**3**
1 No qualifications	49 (49.0)	78 (49.1)	310 (70.6)
2 1 or 2	11 (11.0)	19 (11.9)	51 (11.6)
3 3 or 4	8 (8.0)	21 (13.2)	25 (5.7)
4 5 or 6	8 (8.0)	14 (8.8)	11 (2.5)
5 7+	9 (9.0)	11 (6.9)	19 (4.3)
6 UE	9 (9.0)	10 (6.3)	19 (4.3)
7 HSC	3 (3.0)	3 (1.9)	2 (0.5)
8 Bursary	3 (3.0)	3 (1.9)	2 (0.5)
9 Scholarship			
Total	100 (14.3)	159 (22.8)	439 (62.9)

From these tables it is clear that as well as disadvantage for some, there is advantage for others. Intellectually able children from low SES families are not getting the qualifications from school one would expect; intellectually less able children from high SES families are passing high level exams.

It is clear from many other studies that IQ tests and school exams do not show the true ability of low SES people. This means that our table is likely to underestimate the true position : the disadvantages and advantages are greater than they appear.

Calculating the National Level of Wastage

The figures presented here can be used to give an approximate estimate of the wastage occurring nationally by applying them to the 54,314 students leaving school in 1982.

Firstly, we estimated the number of 1982 school leavers we might expect in each of the SES Groups. For example, 23 percent of the male labour force were in SES Group 2 in 1981 giving a national figure of 12,492 school leavers in this group.

Secondly, we estimated the number of high, average and low ability students in each of the three SES Groups.

Thirdly we estimated the number of SES Group 2 and 3 students we would expect in each of the nine qualifications categories used in the Christchurch study if SES Group 2 and 3 students performed at the same level as their equally able SES Group 1 peers.

Fourthly we calculated the number of SES Group 2 and 3 students we would have expected nationally in each of the achievement categories if the students in the Christchurch sample are typical of the country as a whole.

Finally, we found the differences between the values calculated in steps three and four and summed them across the two SES Groups to give the values shown in Table 5. Positive values indicate the over representation of SES Groups 2 and 3 students in the particular qualifications categories while negative values indicate under representation.

Table 5

Over and under representation of SES group 2 and 3 school leavers
in nine qualification categories

	Ability			
Achievement category	**1**	**2**	**3**	**Total**
1 No qualifications	332	1877	2343	4552
2 1 or 2	160	1420	94	1674
3 3 or 4	561	1097	–98	1560
4 5 or 6	284	428	–572	140
5 7+	465	–233	–567	–335
6 UE	922	–1142	–585	–805
7 HSC	–279	–1504	–308	–2091
8 Bursary	–2181	–1909	–308	–4398
9 Scholarship	–264	–35		–299

The vital comparison is between SES Group 1 pupils who did get a qualification and SES Group 2 and 3 pupils, of equal ability, who did not.

In total the SES Group 2 and 3 students missed out on 299 Scholarships, 4398 Bursaries, 2091 HSCs and 805 UEs. Even if the figures are discounted at 10 or 20 percent to allow for the fact that our assumptions may not hold exactly, the figures are still alarming. It is obvious that there is a vast pool of talent which is being wasted when SES Group 2 and 3 students leave school under qualified, given their potential.

Seventy percent of SES Group 1 students with UE went on to university. If we assume that, under a more egalitarian system, as many students from Group 2 and 3 backgrounds who would have passed UE or higher qualifications would also have gone to university, then an extra 5315 would have gone to university in 1983. If we assume that on average, students entering university stay for three years, then approximately 16,000 extra students would have been in the university system by 1985. This means that were all students in New Zealand able to fulfil their potential to the same level as SES Group 1 students, the country would need an extra two medium sized universities.

Human Capital Theory and the Wastage of Talent

Will financial barriers such as fees and loans further deter low SES students from attending universities and polytechnics? In our view the issue is quickly settled. Working class students have traditionally left school because their families have lacked money and because they have not thought much of education. Human capital theory is simply false when it comes to the issue of human motivation because it ignores the fact that the material conditions of people's lives translate into specific assumptions about the nature of the world and particularly education. Any additional financial barrier to education will inevitably lead to a widening of the gap between the higher and lower SES groups and a further wastage of talent as lower SES students under-perform.

But does this matter? Do we need greater numbers of educated workers? The answer to this question turns on the economic strategy adopted by government. The choices that are made will have a strong bearing on the kind of educational policies that are adopted. In a modernised high technology (MHT) economy where diversified high quality production is a goal, talent must not be wasted and any new education system will be designed to see that it is not wasted. In a rationalised high technology (RHT) economy, mass production by people is simply replaced with mass production by machines. The result is high unemployment and talent can be wasted since policy and innovation are assigned to a small elite. In a low wage, low technology (LWLT) economy, talent is almost a nuisance and no special educational provision is needed.

The type of educational system we have depends on the type of economy we have. The type of economy we choose is a political choice.

Notes

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The Christchurch School Leavers Study was described in detail in
  Lauder, H. and Hughes, D. (1990) Social Inequalities and Differences in School Outcomes, *New Zealand Journal of Educational Studies*, Vol. 25, No. 1, pp. 37-60

and the results commented upon further in
  Hughes, D. and Lauder, H. (1991) Human Capital Theory and the Wastage of Talent in New Zealand, *New Zealand Journal of Educational Studies*, Vol. 26, No. 1, pp. 5-20.

The figures for total school leavers (54,314) are from
  Department of Education (1983) *Department of Education Statistics*, Wellington: Department of Education.

For details of how the estimations were made see either of the first two references.

New Zealand secondary school qualifications

School Certificate (SC) is an external examination sat in separate subjects at about 15 years of age – usually at the end of the 5th Form – Year 10.

Sixth Form Certificate (SFC) is undergoing a change but was at this stage an internally assessed, separate subject, qualification, generally regarded as less academic than University Entrance (and available in more subjects) but whose top grade passes were equivalent to University Entrance. Awarded at the end of the 6th Form – Year 11.

University Entrance (UE) has been phased out since this data was gathered. It was internally assessed (with an external back-up) usually a year after School Certificate, at the end of the 6th Form – Year 11.

Higher School Certificate (HSC) was internally assesssed and almost automatically awarded after one year's study beyond University Entrance at the end of the 7th Form – Year 12.

Bursary was an external examination set and marked by the Universities and different grades of pass gave different (small) payments to those entering universities. Sat at the end of the 7th Form – Year 12.

Scholarship is the name given to the highest grades of Bursary.

For an example of the argument that education is a commodity and that buying knowledge is what any sensible person would do, see a Treasury official's submission to the Hawke committee on tertiary education in
  Prebble, M. (1988) *Social Returns and Government Spending on Post-Compulsory Education*, Wellington: The Treasury (Mimeo).

Why working class students leave school has been well discussed in
  Willis, Paul E. (1977) *Learning to Labour: How Working Class Kids Get Working Class Jobs*, Westmead: Saxon House

and in this issue of ***set*** see the next item
  Wilson, Christine and Dupuis, Ann (1992), Poverty and Performance, in ***set***, No. 1, 1992, Item 15

and in the context of the Canterbury School Leavers Study in
  Lauder, H. and Hughes, D. (1989) *Quantitative and Qualitative Analyses of Educational Inequality and Social Mobility*, Christchurch: Dept. of Education, Canterbury University.

That IQ tests do not show the true ability of low SES people can be found revealed and discussed in
  Evans, B. and Waites, B. (1981) *IQ and Mental Testing*, London: Macmillan.

and
  Tuck, B. (1983) Education and Tests of Scholastic Ability: Is There a Baby In the Bathwater? *NZ Journal of Educational Studies* Vol.18, No.2, pp.165-71.

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set research information for teachers
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POVERTY AND PERFORMANCE

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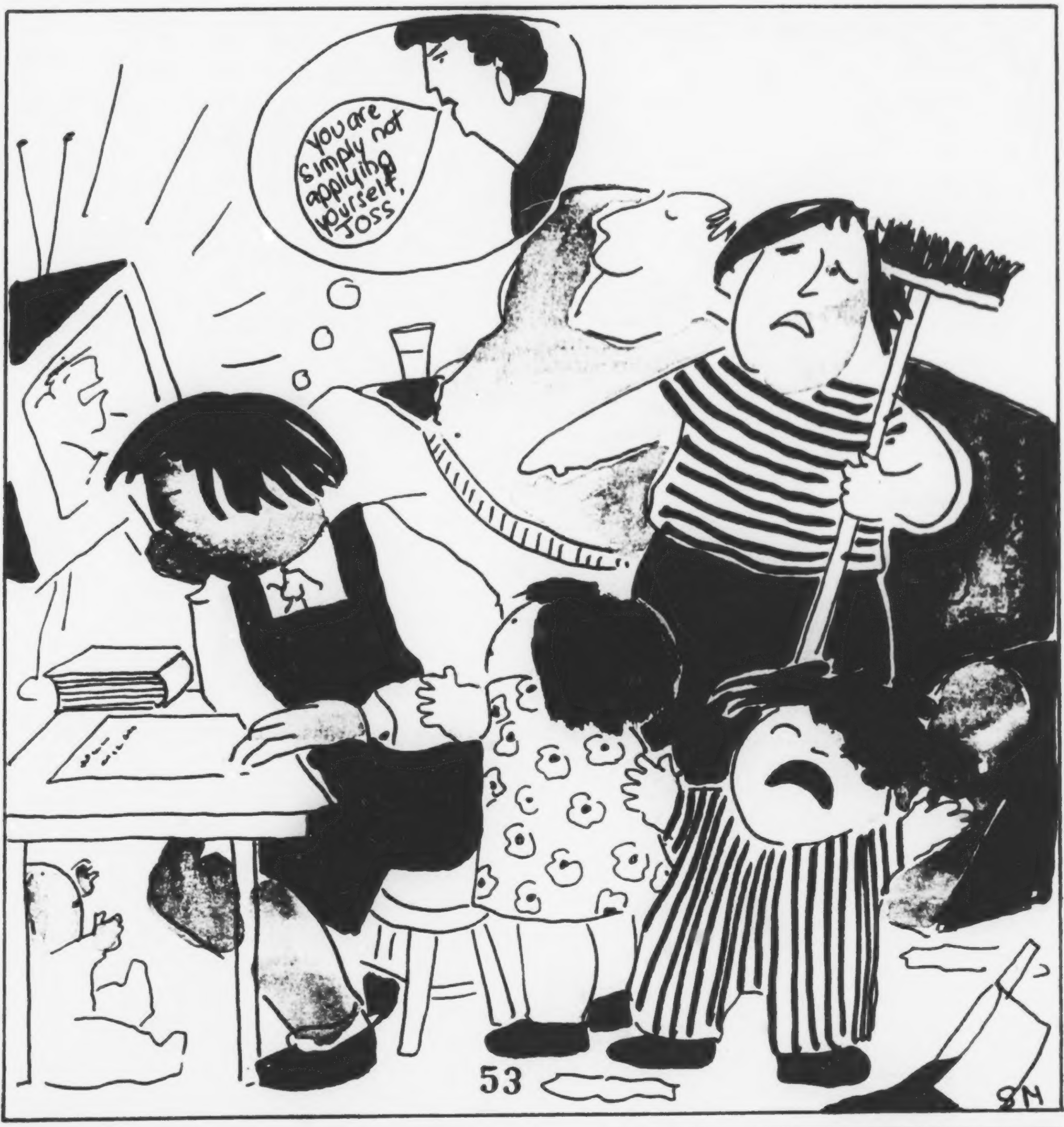
You are simply not applying yourself, JOSS
SM

Shona McLean

POVERTY AND PERFORMANCE

Introduction

BACK IN 1984 the effects of low wages were being felt in New Zealand. There was a sharemarket boom (against the trend), followed by a crash in 1987. Since then real wages have dropped and benefits such as Unemployment, the Family Benefit and Domestic Purposes Benefit have been cut. Costs which used to be subsidised, such as daily transport, doctors visits, prescriptions and school extras have increased. Being unemployed is even more likely for the present generation of school leavers than it was back in 1985 when the research for this paper was undertaken.

For these reasons please consider, as you read, whether any of our findings are out-of-date. Does poverty still affect school performance? It did in 1985. The reasons were not simple. They were bound up with life style, expectations, tradition, as well as dollars. In other reports we have discussed the theoretical explanations involving class and cultural capital which we believe help make sense of the link between poverty and poor school performance. In this article we will try to avoid these and let the facts speak for themselves, particularly through the comments of the participants in the research.

In the 70s it was suggested that *cultural deprivation* caused underachievement at school; in particular that children of poor families were brought up in such a way that they learned to expect and to live in poverty. It was called the cycle of deprivation and it was thought education could break it. Major preschool programmes in the USA had as one of their aims the eventual elimination of poverty. It hasn't worked. Afro-Americans and Hispanics have not had their poverty lifted.

More radical thinkers have put forward different reasons for the continuation of poverty. The rich run things their way (they have the money to do it) and that includes keeping the poor poor, keeping power in their own hands and structuring an education system that has resulted in failure for a significant number of economically deprived students.

Again, you may find our discoveries confirm or deny these theories.

Background to the research

The impetus for this research came from the observations of one of the authors who was the home-room teacher in a female, single-sex, urban high school. She perceived that her home-room students were not necessarily low-ability students although their achievement levels might lead one to think so. What did impress her was the number of home-room students who came from very poor families. From this point the authors set out to try to understand the link they saw between poverty and poor school achievement.

For the purposes of the study, three groups of students were identified. The first group, Group A, were the twelve home-room students. In the school where our research took place the home-room situation catered for students who were perceived as having special learning needs and who would best respond to their needs being met by being in a small class with the same teacher for the core subjects.

Two control groups, each also made up of twelve girls, were then established in order to explore the issues of differential achievement and family income levels. There were two criteria for student selection to the two control groups. The first was high achievement. The second was parental occupation as an indicator of family income. These groups we called:

Group B – high achievers, low income
Group C – high achievers, high income.

An interview programme was set up at school in which interviews were carried out with the girls. Later, at their homes, their mothers and a few fathers were also interviewed.

The three groups

Group A (Home-room)
Fathers' occupations included council labourer, labourer/driver and freezing worker. One quarter of the fathers were unemployed. Two fathers were of higher socio-economic status. However only five of the twelve girls actually lived with both birth parents.

Seven of the mothers were in paid employment, two full time. Two were cleaners, three worked in shops, one worked at home as a ticket writer and another did craft work. One mother was a trainee playcentre supervisor (unpaid). Three mothers were housewives. There was no information available on one mother so the interview was with the girl's father with whom she lived.

On average the fathers of these girls had spent two years at high school, while their mothers had been at high school slightly longer. Five parents had had no high school education at all. Five girls lived in single parent families. One girl was Maori.

Group B (High achievers, low income)
This group was twelve high-achieving girls from the top fifth form (Year 10) class.

Their fathers' occupations included taxi driver, rubber worker, fitter and turner, watersider, and mechanic.

Nine mothers worked in paid employment outside the home. Four were office workers, one a nurse, one a teacher, one a shop manageress and two were distributors. Four of them worked full time. Three mothers were housewives.

The average time spent at high school by the fathers was 2.9 years. For the mothers it was 3.3 years. One girl was of Chinese descent. Three girls lived in single parent families.

Group C (High achievers, high income)
This group was twelve high-achieving girls whose fathers were well paid. Three were in education, three were civil servants, one a scientist, and five were in business.

The mothers of four of these girls were teachers, one a hostel matron, one a nurse, two office workers, and three housewives.

The fathers of these girls had spent an average of 3.5 years at high school. Three had university degrees. Their mothers had spent an average of just over three years at high school. One mother had a university degree.

Two girls lived in single parent families. One girl was Maori.

Group A

Family income

Many of the girls lived in homes where the weekly income fell well below that of the average ordinary weekly earnings of all New Zealanders which in August, 1985, amounted to $311.

Five homes were supported solely by Domestic Purposes, Unemployment or Sickness Benefits, bringing in, for a solo parent with one child, $182. For a married couple with one child it was $198. In five of the seven homes where one or both parents were in paid employment, their total weekly earnings were also well below the average for New Zealanders. Thus two-thirds of this group lived in relative poverty.

To a large extent the material circumstances of parents determine the life chances of children. It is quickly calculated from public data that those children who live in poverty are those least likely to succeed within the school system. Low family income and high drop-out rates go together.

As an illustration of poverty here is what we found when we visited Tracy's mother. Tracy is the eldest of five children whose ages range from a few months to fifteen years. Tracy's stepfather works as a council labourer. The current award wage for this type of work was approximately $240 take-home pay per week. In addition the family receives Family Benefit and Family Care. Tracy's mother supplements the family income by working part-time as a cleaner. This is made possible by Tracy assuming her mother's role in the household, taking care of the four younger children, preparing the evening meal and carrying out other domestic tasks. The family have just bought a house but with mortgage commitments, expenses associated with home ownership and other domestic outgoings there is no money left to carpet and furnish their home. Paths and fences have yet to be completed. Landscaping is out of the question. The family car is old and in need of repair. It does not have a warrant of fitness so is not driven beyond the immediate neighbourhood.

Poverty imposes limits. We believe there are strong links between financial hardship in the home and underachievement at school. All but three girls in this group lived in areas of relative disadvantage or need (identified by the Department of Health as areas with a lack of community and cultural facilities). In general the standard of housing was poor, lacking space and privacy. Most of the girls shared a bedroom and there was no quiet place for them to do homework.

Poverty also meant that the lives of the girls were home bound. Lack of money restricted involvement in any activities outside the home that required money. For example: uniforms, equipment or payment for lessons. Half of the girls' families had no car, therefore activities that required a car were out of the question.

Home life

At home, with few exceptions, the girls were relied on to perform a variety of domestic chores like cleaning, ironing, cooking, dishwashing and in many cases helping with younger siblings. Each week the average time spent on these tasks was twelve hours. This also included baby-sitting for parents and neighbours, and was the means by which they earned their pocket money. With baby-sitting included, the girls earned on an average $15 per week. Baby-sitting was seen as a means to an end. It was not a job relished by any of the girls.

Because their lives were centred in the house, there was a concentration on so-called feminine tasks. These tied the girls to their own or their neighbours' homes and afforded them little opportunity for moving out of their immediate environment.

Within many of the households we saw an inter-female dependence. The mothers needed the girls' support through their labour and child minding, and the girls needed access to money. Both satisfied each others' needs. Thus working class income was recycled within the family. Often too, the girls' domestic labour enabled their mothers to take a job outside the home, thus providing a practical solution in these homes where the men or boys did little around the house. The households tended to be authoritarian, male dominated and male oriented – roles for all family members were clearly defined and household management was clearly a female task.

In this group family size averaged 4.0 children, a factor which contributed to the financial pressures on the family, as well as the domestic workload.

From our observations the majority of the mothers worked very hard, and put in extremely long hours. Some had dual roles as housewife/mother and paid member of the work force in (traditional female) poorly paid jobs.

Within this group we were aware that females in at least half the homes had to contend with some measure of domestic violence or sexual abuse. In such circumstances strong, stable family relationships are difficult to forge and sustain.

For poorly paid, working class men life can be frustrating and demoralising in a society where a man's worth is judged according to the size of his pay packet. Because of little education and the sort of jobs they were in, scope for advancement was restricted, despite the myth that hard work brings reward. Their work was characterised by powerlessness; but at home the male can be a potent force in relation to the female members of his family. The demands that flow on from this are intense, and often the household revolves around the male and his expectations. Such patterns of behaviour are frequently inflexible, and based purely on tradition with a strict division of labour adhered to and roles determined by gender, and never negotiated.

We found that the girls accepted unquestioningly that the traditional female role is the 'natural' role for women and so they carried out the female domestic tasks allotted to them. On the other hand it was not expected that their brothers should perform similar domestic tasks or be tied to the house as their sisters were. The girls saw their brothers at the same age as having more freedom to pursue social activities and having fewer limits placed upon them.

> *My brother has more freedom than me. Mum thinks that because I'm a girl I'm not allowed out as late.*
>
> Jan

In fact, the boys were treated in much the same way as the adult men in the household with little domestic input demanded of them. The same degree of interdependence that existed between mother and daughter was not apparent between son and either parent.

In the male-dominated households, where financial pressure was evident, adult relationships were frequently strained. Few of the girls in this group had been exposed to stable, long-term relationships. They, in turn had difficulties in establishing and maintaining social relationships with their peer group or with adults. Eleven of the twelve in this group said they had a 'best friend'. However, most of these best friend relationships were transitory, often fraught with difficulty and dependent on recent activities or family approval. Only three of the girls had maintained a long-term friendship with another girl.

A few of these girls spoke warmly about their parents but they were in a minority. Many facets of the girls' lives caused disagreement and conflict between them and their parents. While they understood they were needed at home, they nevertheless sought opportunities for independence. Typically, they would go to one another's houses, look around the shops, or go to the park and smoke. Often their attempts at establishing independence involved engaging in activities unacceptable to parents. The classroom was often the arena for bragging about social activities and escapades that occurred out of school hours. In this way girls conformed to what they perceived peer group behaviour to be.

Most parents spoke of difficulties in dealing with their daughter's behaviour; they tried to impose rules and set limits on the girls' social lives. Some of the girls directed a tremendous amount of energy towards circumventing these limits; invariably conflict resulted.

> *Yes I do have lots of rules but it usually ends up with a yelling session. Because I can't get my point of view across to her she yells and slams and goes in her room. I've tried calmly talking to her ... When I say why she can't do something or if I let her do something, she goes the complete opposite and does what she's not supposed to be doing. She abuses that trust I've put into her.*
>
> Alison's mother

Most of the mothers were concerned that their daughters might get pregnant. For them this was a very real fear and was the basis on which they set the rules. It became evident that in their efforts to shield and protect their daughters they in fact intensified the conflict in their relationships.

Although the girls' lives were generally centred around the home, in close physical contact with members of their family, they had very little idea of many of the activities, circumstances and even employment of parents, brothers and sisters. Family talk was not about such (dull?) matters and so an important medium for learning about the world around them was curtailed.

Television viewing

Because the girls spent so much time at home it is not surprising that television was a major focus of their lives. All the girls watched television and all homes had television sets. On average, the girls watched 30 hours of television per week. Programme favourites included *Young Doctors, Falcon Crest, Dynasty, Dallas* and *Ready to Roll.* When asked which television personality they would most like to be, the majority chose a male star.

> *Magnum. He's good looking and real nice. He lives on a beach; lives in Hawaii and has a real nice house and car.*
>
> Teresa

Television watching was, for these girls, a passive activity, taking place with an almost total lack of critical awareness. The life experiences of these girls were completely different from and unrelated to those they saw on television. They said that soap operas were realistic yet, to a large extent, the characters in these programmes had lives of opulence, professional jobs and luxurious homes. Yet they could not recognise that their interpretation was contradictory. This led us to conclude that it was an emotional identification the girls felt.

Males play a dominant role in television programmes, particularly in the kinds of programmes to which these girls had heavy exposure like soap opera, 'sit coms', and dramas where men are portrayed as being more powerful, funny, active and more daring than women. The girls were not interested in watching a variety of programmes. Because of this, they did not see programmes which showed alternative perspectives or lifestyles.

We cannot discuss the effect of television without reference to the subtle pressure of advertising. Usually advertising shows women in stereotyped roles, as wives, mothers or girlfriends. It idealises life – all babies are no trouble at all, all homes are havens of peace. Young girls are told by the media that they can become beautiful if only they wear these jeans, that nailpolish or this kind of perfume. To get men to pay attention to you takes only a certain kind of shampoo, toothpaste or pantyhose. This kind of advertising exposure is intended to create desires and needs. But powerfully and subtly it puts women in roles inferior to and dependent on men.

Fashion and money

The desire to appear fashionable was very important to these girls. They shopped for clothes at a chain store that specialised in cheap, fashionable lines. Conformity of dress was one way the girls could achieve some degree of identity with others in their peer group.

All the girls went regularly to a hairdresser. They felt it was important to 'look good'.

> *I go so people won't criticise me.*
>
> Susan

The desire to be 'cool' led a number of them to smoke occasionally. A third smoked regularly, although only one was allowed to smoke at home.

All these girls made their own financial decisions. Most tried to save some money. All had bank accounts, the highest balance being $300. Despite the lack of parental guidance in matters relating to money, some girls managed their money quite competently.

Reading habits

All the girls in this group had reading difficulties. Although all their homes received an evening newspaper and nearly all bought the *Woman's Weekly* and *Truth,* little other reading matter came into the homes on a regular basis. All the girls said they read the newspaper but further questioning revealed that they only glanced at the headlines, the pictures, advertisements and the television page. However, most of these girls exhibited a curiosity about the problems faced by other people. Most girls were quite aware of the current court cases and the personalities involved. Nearly every girl read avidly the problem column in the *Woman's Weekly.*

I like to read about love and teenage girls and their problems.
Leanne

For them, this was the reality of their own lives, so it made sense to read about it.

Libraries were deemed irrelevant by the girls. Two of them belonged to the Public Library but did not use it. The remainder of the group did not belong to a library. When asked about who would use a library regularly they replied:

Brainy people like teachers.
Susan

Old people who have nowhere else to go.
Tina

Leisure activities

The social activities of these girls were limited. Generally their social activities revolved around occasional visits to the cinema and going to town with friends on Friday night. Such visits afforded them the opportunity to shop and possibly meet boys. Their home-based life style, coupled with attending a single-sex school, meant the girls could not meet boys in a structured social situation. Although only one girl had a steady boyfriend, two-thirds of the group thought fifteen was an acceptable age for going steady.

Yes, everybody goes steady at fifteen.
Kay

It gives you something to look forward to.
Marama

They all thought it was possible for girls of fifteen to fall in love. Half said they had been in love. These girls, without exception, were fascinated with boys. They provided a constant topic of conversation and there was a continual air of anticipation about finding a boyfriend.

Girls' attitudes to marriage

All but two of these girls said they wanted to get married. Their ideal age for marriage was twenty-five. Attributes most desired in a husband were good looks, nice personality and a 'bit of money'. They mostly saw themselves in the future as better off married than single. However, some had ambivalent attitudes towards marriage.

Marriage is better because there's someone there, but if you're single you don't get tied down.
Leanne

Half of them wanted to have children when they were older.

Yes one of each, but later on.
Kay

Those who said they did not want children saw them as nuisances.

No they're too noisy.
Leanne

No they're too much trouble and too much work.
Tracy

Both of these girls had spent a lot of time looking after younger siblings and had an appreciation of the responsibilities of constant child care. One girl said she intended carrying on working after she had had a baby. All the others who wanted children thought one could not be a good mother and work full time. Despite the fact that these girls had been exposed to alternative perspectives on family life through their female teachers, it was apparent that the role model endorsed at home was the one significant for them.

Attitudes to education

All the girls talked of learning experiences at primary and intermediate schools in a negative manner. All had experienced learning difficulties. In almost all cases these had been recognised by parents early in their daughter's schooling. Seven parents had approached the school concerning these difficulties. Six of them had not received any help.

I discussed Kelly with him but it was wasted. We didn't get the right response. But I thought, 'he's the teacher.'
Kelly's mother

Some parents did not approach the school because they felt inadequate; others because stresses within the home got in the way.

I was on a benefit in those days and there wasn't much extra money.
Tina's father

Some parents blamed themselves for their daughter's lack of progress.

I thought it was me at fault, I didn't go along.
Kay's mother

Many of the low-achieving girls felt hurt and humiliated by past teachers. They felt they had needs that had not been met, that they had not been treated fairly, and were angry about it. Time and again we heard them say, 'We didn't get help.'

They just went on and expected you to do it and you didn't know how to.
Kay

The girls felt they were getting left behind and sensed the injustice of the situation. This seemed to widen the gap between them and the teachers – whom they saw as unapproachable.

The teachers were unfair. You couldn't go to them.
Leanne

Some even had experiences of teachers being blatantly rude and offensive.

The teachers called us dummies and thicks.
Teresa

They felt that the teachers were not aware of the problems they were experiencing with school work.

She just wanted us to be like her and we weren't.
Marama

One girl had bad memories of being in an open plan classroom, with seventy-one other children and two teachers. She said she found it difficult to withstand the noise. This particular girl was quiet, shy and sensitive. As a result she withdrew, felt left out and left behind. At this stage she was already experiencing problems with reading and mathematics and amidst this type of classroom organisation felt overwhelmed and unable to cope.

These girls identified teachers, class sizes and the system in general as factors that played a vital role in their lack of success at primary school. They were aware they were not receiving the help they needed and had come to realise they were 'academically inadequate'. This translated to:

You start thinking you're dumb.
Kay

Positive comments about primary school were limited.

It was good in Standard 3 because parents came along and helped us with our reading.

Susan

The teacher was good too. She helped us.

Teresa

The girls saw their entry to high school as a positive move.

I liked it. I felt more important and grown up.

Tina

They were enthusiastic about the size of their present class and form room.

You get more help in a smaller class.

Susan

They responded well to teachers who accepted them as they were, and who had realistic expectations of them.

Some teachers kind of joke and even if you say the wrong answers you don't feel put down. It doesn't matter if it's wrong.

Teresa

They criticised methods used by other teachers whose expectations were unrealistic.

In one class we go to we get all these sheets of paper and have to copy them into your books.

Kay

Teachers find that a busy class is not troublesome and some find classes such as this one very difficult to handle. So keeping the students busy becomes a strategy to keep control and discipline. However, when the content of this 'busy' work does not fit the students' needs or abilities their response will be negative. Classroom management based on teacher insecurity and fears flies in the face of child-appropriate education.

The girls expressed enthusiasm about being given real choices. What they saw as meaningful and of interest was frequently in conflict with what teachers expected them to do.

In one subject we've been doing the same thing for about all the term. You do what you're told. It's boring. I'd like to do other stuff.

Teresa

Inappropriate tasks led to rebellious behaviour. Teachers call it 'skylarking' and 'fooling around' and often blamed the girls.

The girls felt angry if blame was misdirected at them for others' misbehaviour in the classroom.

It's not fair. Sometimes you're doing something right and someone else is doing something wrong and you get it blamed on you.

Kelly

Labelling of the girls as 'troublemakers' was more apparent in their mixed-ability classes where they believed that they were always watched.

They watch you to see if you're wearing jewellery, makeup or smoking behind the toilets.

Leanne

None of their families had teachers as personal friends so the girls had no experience of teachers in any context other than the classroom situation.

Teachers expect you to do what they did when they were young, but the world's different now.

Alison

All the girls regarded the school system as inflexible and not catering for individual differences. They felt they had been forced into a rigid, established structure of a traditional nature. From the outset of their high school careers they had trouble identifying with the traditions, ideals and expectations that were presented to them.

They hoped some of us would get up there [Wellington] and be in politics.

Jan

Such expectations were considered by the girls as irrelevant.

The 'option' system came in for criticism by both parents and girls. While still in the last year of primary or intermediate school, decisions were made about subjects for high school. The subjects chosen in the first year effectively locked them into low status subjects. These included home economics, clothing, typing/economic studies and Maori. It was interesting to note that Maori was an option open to these girls but French, German, Japanese or Latin were not. Essentially what had been presented as a broad range of options was in fact quite limited.

The majority of girls would have chosen to attend a coeducational school had the choice been theirs. In all but one case, the parents decided where their daughters would go to high school and it was the mothers who had a greater say in this decision. The girls saw their segregation from boys in school as a measure taken by their parents to keep them on the 'straight and narrow'.

I wanted her to go to a single-sex school so she'd concentrate and keep away from boys. That was the most important aspect.

Melanie's mother

This was not seen as fair treatment by the girls. Nearly all had brothers who had, did, or would attend a coeducational school. When asked why their brothers could go to a school of their own choice and they could not, they took it for granted that their gender made a difference.

Boys don't get into so much trouble. They don't go out and get raped.

Kay

They agreed that they got more work done at a single-sex school. They saw the presence of boys in the classroom as distracting. Yet boys were a source of fascination for them.

We get more work done here than at primary school. [What difference did having boys in the class make?] Everything. We like boys. We all do.

Tracy

Few of their parents spoke of satisfaction with the education system. Many were upset and even bitter when talking about their daughter's education.

I will not be pushed around by the system again. I wished I had known more about it when Kay was younger.

Kay's mother

It was apparent that all the parents of these girls were interested in their daughter's education. However, the girls did not perceive their parents in such a light.

My parents always fall asleep. They're so tired from work.

Melanie

They're always racing around doing something else.

Tracy

Parents caught up in the day-to-day struggle for survival do not have the time nor energy to focus on education as a priority. Their major concern at this stage of their daughter's schooling was that she be able to get a job. Most parents saw high school as the place where students learned skills to take them into the work force. Like their parents, the girls had difficulties seeing how much of what they learned at school was of relevance to future employment.

> *I don't see how my school subjects will be of use in the future. It's too hard to get a job these days and you might not get a job with clothing and stuff like that.*
>
> Teresa

Employment expectations

The girls were aware that obtaining jobs could be difficult. While at primary school one girl hoped to be a dentist, two hoped to be nurses, one a prison officer, veterinarian, air hostess, hairdresser, pharmacy assistant and minister. As their school careers evolved, their job expectations lowered. One girl still wanted to be an air hostess and a few were hopeful of work in the catering field or as shop assistants. The rest said they would accept whatever jobs they could find.

> *I'd like to be a vet's assistant now. I'm not bright enough to be a vet.*
>
> Teresa

Most girls saw themselves returning to school for a fifth form (Year 10) year, but none saw the School Certificate exam as a possibility or a necessity. By this stage their choice of jobs was a realistic assessment of what they were likely to get. One girl pointed out that educational credentials would not help her in the work force.

> *For working in a shop some people don't take you with School Certificate. They have to pay you higher money.*
>
> Kelly

At the beginning of the research the girls were old enough to leave school, but only three were prepared to do so and only if they could find a suitable job. These three said they were looking for jobs but looking in the newspaper was the only avenue that had been explored. The other girls saw themselves as not being ready to leave school yet. Some had discussed the idea with their parents but had decided to stay on for a while longer.

> *I haven't got a job. I sat down and talked to my mother the other day and no, I wouldn't like to leave.*
>
> Jan

Attitudes to unemployment

Most said they would be reluctant to go on the dole, but more than half said they would if they simply could not find a job. Nearly all the girls thought the dole was insufficient to live on. Generally their attitudes towards the dole were scathing.

> *It's the lazy people who are not bothered looking for jobs.*
>
> Donna

Both girls and parents explained unemployment as a result of individual inadequacy.

> *They say there's jobs there if they get out and look. A lot of the problem is the kids' attitudes. They think the world owes them a favour.*
>
> Jan's mother

Although the girls were aware of the high rate of unemployment they did not see this as affecting them. They believed implicitly that work was available for those who wanted it and unemployment was the fault of the individual.

Girls' self-esteem

Throughout the interviews it was obvious that these girls lacked self-esteem and confidence. Repeated failure at school had reinforced their lack of self-esteem. They continually 'put themselves down' and were sensitive to how they were seen through the eyes of other people. They all said that other people's opinions of them, worried them.

> *Some of the girls in my netball team are in high classes. Someone asked me what class I was in and when I told her, she nearly died. She was shocked. She didn't expect me to be in that class.*
>
> Jan

The girls felt their 'inadequacies' deeply and a few manifested their lack of self-esteem in a very disturbing manner.

> *I don't know what to do when I feel like killing myself. I get a needle and puncture my hands or I punch the wall or swear at my friends.*
>
> Marama

They all had trouble finding any achievement in their past of which they were proud. When they did, two girls cited playing sport as their greatest achievement. All the rest identified some kind of domestic work. This was not surprising considering the time spent on domestic tasks, both at home and at school, and the degree of expertise they had acquired over many years.

> *I don't know, just playing sport, I suppose.*
>
> Jan

> *Making my first sponge and it didn't turn out a flop.*
>
> Tracy

The girls were undoubtedly envious of some of the privileges that went with being in the top class, such as canteen duty and meeting visitors to the school.

> *They do work experience before we do.*
>
> Donna

In fact, the girls had no idea whether the top class did, or did not, do work experience first. They simply assumed that the top class got preferential treatment. It was natural for them to be last.

Group B (High achievers, low income)

These girls' homes were, in general, similar in their size and location to those of Group C. Most girls had their own room with facilities for doing homework.

The average family size for this group was 2.9. Half the girls were the youngest in their family. Essentially this meant they lived in adult families.

Only two families in this group did not own a car, in both cases because there was insufficient income. One family was supported by a sickness benefit, the other was a single income family supported solely by the mother.

Family income

While for this group, the fathers' occupations could be classified as working class, in general their incomes exceeded those of the low achievers' fathers. In some cases this was because of allowances, for example a sales representative earning approximately $255 per week also received commissions, a car allowance, a travelling allowance, accommodation and other reimbursements.

Home life

All the girls spoke of having a close relationship with their mother, some with their fathers as well. The mothers spoke of trusting their daughters and having confidence in their daughter's judgements. No mother indicated any measure of concern over the issues of control, freedom or discipline for her daughter.

> *Sharon likes us to know where she is. We don't worry. If she goes out with her girlfriends she's very well organised, even to getting a taxi home.*
>
> Sharon's mother

Friendships were very important to the girls as half of them spoke of having a best friend. Personal relationships with their friends and their families were easy going, warm and lacking in conflict.

These girls spent an average of 2.5 hours on domestic duties each week. However, three girls spent about 5 hours per week on a variety of domestic chores while their mothers were at work. Their mothers were dependent on them for their domestic input, particularly the preparation of the evening meal.

All girls in this group, including those who contributed to the running of the household, had a large amount of free time to devote to school work and other leisure-time activities. Four had had ballet lessons, two had studied the piano, one the guitar and one the clarinet. One girl was in an orchestra. Most girls in this group were interested in sport. For some it was an extremely important part of their lives. For example one girl had her own horse and spent long hours caring for it and preparing it for show-jumping competitions. Three others had represented their province in their chosen sport. The sporting and cultural activities available to two of the girls had been limited because of the financial circumstances of their families.

Fashion and money

On average the girls received $8.20 per week pocket money. The girls who worked at home were paid for this, boosting the average.

The top priority for all these girls was achievement at school. As a consequence they were prepared to curb their social lives. One girl had a steady boyfriend while the others were content to spend long hours on school work.

Conforming to fashion trends in clothes and make-up was a high priority.

> *You don't feel ready to go out if you haven't got make-up on.*
>
> Angela

> *Sometimes if you're with older people you feel better, you fit in better.*
>
> Michelle

However, their desire to conform did not lead to a gullibility, or wholesale acceptance of products pushed through advertising. For example, no girl in this group smoked, it was seen as anti-social.

> *I think it's disgusting. It just makes me sick. It stinks.*
>
> Sharon

Television viewing

These girls watched, on average, 15 hours of television a week. Some chose to do their homework in front of television. They watched a variety of programmes, some of which were termed 'rubbish' by their mothers.

Reading habits

All their homes got a daily newspaper. The girls read a variety of books, although in some cases these books were set school texts. While three girls mentioned 'adult' books (James Herriott, Jean Plaidy and Agatha Christie) most enjoyed books that were written for teenagers.

Attitudes to education

The mothers of five of the girls identified problems at some stage in their daughter's schooling. This was confirmed by the girls. The problems were both academic and social. In all cases the parents had been in touch with the school.

> *I had trouble with maths. I couldn't understand how to do fractions, so Mum went and talked to the teacher. I got extra books and that helped.*
>
> Helen

> *Melissa had trouble with learning to read. I was told she was a trouble stirrer. Her teacher was very inadequate. I felt I was a pushy mother. After underachieving she was put into the bottom Standard 1. Luckily she had a teacher who put a lot of time into her and got her up to the top of the class within a year.*
>
> Melissa's mother

Despite the fact that these girls were achieving well, they talked about many shortcomings within the school system, both at the primary and the secondary level. In general, they viewed the system as inflexible. While this posed problems, they had the personal resources to cope with most situations and saw other students' problems as greater than theirs. One aspect of high school life that drew criticism was the all pervasive aspect of competition, which the girls felt put them under intense pressure and stress.

> *Sometimes the teacher says you're competing against the next girl and your essay has got to be better than hers. That's what I don't like.*
>
> Michelle

However, at the same time they relished the sense of accomplishment that came with gaining a place.

> *I really like geography. It's the first time I've been top in class at anything and I like it.*
>
> Marie

They saw the education system in general, rather like a factory for the cloning of girls.

> *The image that this school expects us to project is just like any other school. That all the girls are good and perfect, neat and attentive.*
>
> Monique

Both parents and girls in this group criticised the option system at high school.

> *Subjects taken in the third form [1st year of high school] have to be taken right through. If it doesn't work out it can be disastrous. It could turn a child off their whole school life.*
>
> Jamie's mother

The girls spoke at great length about teachers. They did not see teachers as coming from a world different from theirs.

> *They're not different. They're just people doing a job. They have children and families.*
>
> Marie

They readily acknowledged the qualities of some teachers and the efforts made on their behalf.

> *You give them respect when they treat you as equals.*
>
> Michelle

The personalities and attitudes of their teachers were of great concern to the girls. They perceived the effect a teacher they saw as unsatisfactory could have on their future.

> *It's not that particular subject, it's the teacher. Very few people are going to take that subject in the sixth form now.*
>
> Marie

Employment expectations

Most mothers were not fully aware of the true potential of their daughters' academic ability. Many said they 'hoped' their daughters would pass School Certificate, the lowest of the external examinations. However, in all but three cases the parents expected their daughters to have a sixth form year (Year 11), to pass exams and to leave to get a 'nice job'. The girls saw their futures as their mothers did. 'Feminine' jobs such as bank-teller, nurse or air hostess were invisaged, none of them requiring university degrees. They did not see university as a natural progression from school, upper limits had been set (Sixth Form Certificate), they recognised the importance of qualifications up to this point and neither mothers nor daughters envisaged a future without it.

> *If I left school now, without any qualifications, I'd get nowhere in life.'*
>
> Melissa

Two mothers had analysed their own job limitations, seeing their lack of opportunity as due to insufficient education. They were adamant that the same thing was not going to happen to their daughters. The other exception was a Chinese girl whose parents revered education and the opportunities all their children would have in New Zealand through education.

> *Education is more important than anything else. It is the main thing for the human mind and the world. University education - we hope so. We will support her. She is the most important, she will set the example.*
>
> May's mother

May is the eldest of five children. Her father is a sickness beneficiary and the family lived in poverty. Despite this May's mother had scrimped and saved $1000 for May's future university education

The three girls girls who intended to go to university understood that their opportunities would be more limited if they cut short their education.

> *I see my friend now. She was about the same level as me but she's leaving school at the end of this year and wants to be a hairdresser. She didn't want to be a hairdresser before. She wanted to be something good, you know, to go to university. Now she doesn't want to. She said to me, 'You'll grow out of wanting to go to varsity. I did.' I still haven't. I still want to go.*
>
> Marie

Attitudes to unemployment

Unemployment was of little concern to either mothers or daughters of this group. The girls explained unemployment as a result of individual inadequacy. This was a view shared by most parents too.

Attitudes to marriage

All these girls hoped to get married some time in the future and all but two wished to have children. Their ideal age for marriage was twenty five. They desired in a husband, lots of money, an easy going nature and an active and healthy lifestyle. All thought that motherhood meant stopping work until the youngest child turned five.

> *You could work if it was part time, but I don't think you would be a good mother.*
>
> Kim

While they realised it could be frustrating to stay at home full time with pre-schoolers they did not feel they could decide otherwise.

> *Going back to work depends on the man.*
>
> Angela

They could see coping strategies housewives use including leaving children with grandmothers, friends or husbands for a few hours while they go out, or do part time work. They did not see this as dependence, nor did they see that part time work would not be the continuation of a career.

Self esteem

As a group these girls were quite confident. They had all experienced success at school, and often in other fields as well. Despite this, they expressed doubts about their abilities, which had no basis.

> *My greatest achievement was fluking it into this class.*
>
> Jenny

Two girls defined their greatest achievement as success in ballet and others in sporting success. Only one girl identified academic success as her greatest achievement.

Group C (High achievers, high income)

The houses of these girls were generally modest, however, four were in high-priced property areas, were more spacious and expensively furnished. Every girl had her own room, and a specific area in which to do her homework, including a desk with adequate lighting. The average family size was 2.75. Each family had a car, sometimes two.

Home life

Without exception these girls spoke fondly of one parent and in most cases of both. The girls had an intimate knowledge of, and were interested in, the lives of their family members. They saw it as 'natural' that parents would be interested in and concerned with their activities. They saw their parents as playing positive roles in their lives and enjoyed time spent with them.

> *I spend Friday nights with Mum. We go into town. We just like to sit down and watch people go by.*
>
> Kate

No parents indicated any concern about freedom for their daughters.

> *It's not an issue yet. She usually wants to do things we think are reasonable.*
>
> Rachel's mother

Friends also played an important role in the girls' lives, but the emphasis was not on having a best friend but more on being part of a group. The girls felt that within their households brothers and sisters were treated alike: there was no specific domestic role for them because they were girls.

Leisure activities

The average time per week spent on domestic duties by these girls was 1.5 hours. They were then able to devote as much time as they wished to both their school work and leisure activities. With few constraints on their time they were free to enjoy other aspects of living which took them beyond their immediate environs. Many were involved with cultural activities. For example, half the girls had had piano lessons, three had speech lessons, two played the flute, one the violin, one the organ, two had drama lessons and two ballet. One girl belonged to an orchestra. Most girls played sport. Their choices included netball, tennis, swimming, trampolining, soccer, rowing, cricket, surfing and hockey. Costs such as fees, uniforms and transportation had not excluded any of these girls from taking part. Yet these girls did not handle large amounts of money themselves: on an average they received $5.50 per week pocket money.

Through the range and diversity of their activities these girls met boys but because they placed such emphasis on attaining high marks in exams some (who had boyfriends) had chosen to limit their socialising with boys until time allowed it.

Fashion

They were aware of their individuality and desired to express it. For example they saw conformity in fashion as undesirable.

> *I used to like really trendy expensive things but now I like to be individual. I get things from all over the place, particularly op shops. It gives me a greater range of wardrobe.*
>
> Laura

None of the girls smoked. Despite the fact that a proportion of their parents did, they found it an unacceptable habit.

Television viewing

On an average the girls watched 11 hours of television per week. They selected a variety of programmes. They liked pop music programmes and some of the dramas and soaps. They also enjoyed educational and informative programmes. *Mastermind, Our World* and *Saturday Playhouse* were popular choices.

Reading habits

All their homes received a daily newspaper. However, their leisure time reading was characterised by its sophistication and diversity. The list included books such as *Sex Lives of Famous People, Lace, Tales of the Unexpected* and *Hitchhikers' Guide to the Galaxy.*

Attitudes to education

Five girls in this group had had some learning difficulties early in their school careers. In four of these cases parents approached the school. Two received a positive teacher response and two a negative response.

> *The teacher was hard to convince that Laura wasn't slow The S.T.J.C. was hands off, don't interfere. The acting hea was placating but not much else. So I went to Speld [Specif Learning Difficulties Association].*
>
> Laura's mother

This case illustrates the point that parents who have financial resources and knowledge of the system have access to alternatives and options not available to others. Some of the parents pointed to boredom as the cause of their daughter's problems.

> *Her first year was frustrating. The teachers kept her on prereaders all that year. She turned off.*
>
> Rachel's mother

All the girls regarded the high school system they were in as inflexible. Individual differences were not catered for. The girls felt they had been squashed into a rigid, established structure. Well aware of their abilities, they felt pressured to perform, not only for themselves, but to uphold the name of the school.

This group was channelled into language classes by the option system. In hindsight they felt this an injustice. On the one hand they were told their school had a great range of subjects from which to choose. The reality of the situation was very different: they were locked into 'options' for at least two years. At the beginning of their third year at high school, with two successful years completed in the subject, faced with the external exam the next year, it was inevitable that they would take the subject again even when disenchanted with it.

> *I can't see the point in doing things I don't enjoy. I didn't want to do Japanese but was forced to do it. I was told they thought I was a languagey sort of person. How did they know?*
>
> Georgina

> *I would have liked to change from typing. I found it thoroughly boring.*
>
> Lucy

Most parents felt the school system did not cater for all children. The Maori mother commented:

> *I would like to see implemented something to do with their cultures. In the school system these are pushed aside. We just have to fit in the other bracket. A lot of kids today cry to be understood. Their identity is gone. School is essentially a pakeha system. Too many of our kids don't want to be there and don't achieve.*
>
> Aroha's mother

At this point in their schooling high marks were all important to these girls. School held a very important place in their lives.

> *School and school work has to be important. It takes so much of my time. I have school in the day and then do about four hours homework.*
>
> Anna

Teachers were judged by girls, parents and the school on their ability to help the girls achieve high exam marks. Teachers who frustrated the attempts of the girls to get high marks were criticised. However, the girls readily acknowledged the other qualities of some teachers and the efforts made on their behalf.

Employment expectations

Parents and girls had maintained high expectations throughout schooling. Career choices included lawyer, doctor, journalist, diplomat and veterinarian.

Attitudes to marriage

All the girls expressed a wish to get married, ideally at 25. Most spoke of completing their education, establishing a career, travelling and experiencing life before marriage could even be contemplated. They had definite ideas about husbands.

> *From a lot of the men I've observed I often think men don't mature. So when I marry I want someone who's grown up, someone you can talk to.*
>
> Laura

Two of the girls did not want to have children. Almost all the rest saw working and raising a family as quite compatible, and did not see rearing children as a purely female task. They expected their husband to play a major role in child care.

> *I think the husband should be equally willing to give up his job if you both choose to have a child. But you'd discuss all this before you got married.*
>
> Laura

Self-esteem

These high-achieving, high-income girls displayed a marked degree of confidence and self-esteem. This flowed naturally from the success they experienced both at school and in their other pursuits. They offered many and varied examples of what they considered their greatest achievement.

> *Prizes in the third and fourth form at school made my parents very proud.*
>
> Laura

One outstanding feature of these girls was their awareness of what was happening in the world. They talked freely about such issues as feminism, censorship, nuclear war and injustice and could see the impact of these wider issues on their lives.

> *I think the French testing at Mururoa Atoll is an injustice to the human race and all sea life.*
>
> Georgina

They appeared to be well aware of the paths their lives would take, and had quite clear-cut plans of how to attain their goals. Nevertheless they recognised that there were constraints on their lives.

> *The people who set society's rules are men so they do things for the betterment of man and not woman.*
>
> Emma

However, they were not prepared to concede that their sex was going to make a difference in shaping the courses of their lives. They were aware that they could do this, a crucial part being success within the education system, the culmination of which was a university degree. They could not envisage a future without credentials.

Discussion

The three groups were divided from each other by not only success and wealth, academic achievement and income, but also by, for example, different family life styles, by different expectations, by different attitudes to boys, fashion, recreation, the school, teachers, and people in power. After looking at these, several things became clear, having shown up in our interviews. Some seemed trite and obvious, but put together they point towards ways in which society, if it does want equity, must change the educational opportunities it offers.

1. Family income is not equitably distributed.
2. This limits the chances of the least well-off.
3. Power and influence are not equally distributed.
4. Patriarchy limits life chances for girls.
5. Schools maintain social inequalities.

Following these through:

1. Family income figures came mainly from official figures, and the interviews confirmed our calculations.

2. The obvious limits to chances to learn are in such matters as: no private space for the low-income girls, no car for trips to sports, guides, museums, holidays, the sea, the mountains, the bush, farms... all the places where learning can begin or be consolidated. The less obvious limits are those where low income means lives limited to child minding, housework, and helping overstretched single parents, beneficiaries or working mothers. The strain of being around the house so much is relieved with TV and occasional 'flings', which parents distrust and therefore try to control, thereby building up even more pressure to rebel. Such 'rich emotional lives' are not conducive to academic study.

Men whose working lives offer little satisfaction and whose pay packets are mean, are not emotionally equipped to be open handed, co-operative, and involved in their daughters' lives. There may be violence; there is certainly a tradition of rigid sex roles. Such roles are easily understood since clearly each sex is taking a 'proper' share of family support, men earning, women caring.

So low income creates a situation where tradition is the easiest path to follow and great respect for learning is not part of New Zealand's tradition. Where respect for learning is a tradition, as in the Chinese family, income obstacles are overcome at great sacrifice of life style for the parents.

3. Inequalities of power are clear in the parents' reactions to news that their daughter was doing badly at school. Most low-income parents were unable, or unwilling, to approach the school or teacher, or did not realise that they could. Those who did approach the school, did not get help. Only one high-income parent got no help when she approached a school, and she knew where (and had the money) to look for outside help. Maybe the schools were reacting, unfairly, to signs of wealth and academic expectations, but the most depressing discovery is that the low-income parents blamed *themselves* for their daughters' lack of achievement.

4. Low-income homes are typically run with strict sex-role divisions. This was most marked in the homes of the low-achieving girls, where the fathers had little involvement in their daughter's day-to-day lives. The strong mother/daughter dependency in these households worked to maintain the rigid division of labour. This meant that in the poorer households the girls had to spend much more time on household duties.

5. It is a liberal aim that schools should compensate for the inequalities in society. This means that all should be educated to the best of their ability regardless of income, sex, religion, race, etc. However, our data suggest schools do not compensate. Rather it appears schools maintain inequalities.

Recommendations

Until wealth is distributed equitably it is difficult to be optimistic about the future of low-achieving students in our schools. Some measures can be taken but the success of these measures will depend on funds and staff from government sources.

It is widely believed that in New Zealand education is free, yet parents are constantly called on to pay for numerous educational expenses. These include books, equipment, option expenses like dressmaking fabric, trips, concerts and cultural experiences. These are on top of expensive uniforms and sports clothing parents *must* provide. For some these costs are impossible to meet. It is pointless to say that *schools* should recognise this fact and make funds available. Schools are already stretched to the limit. It is the obligation of *governments* to give all students a 'fair go' in the system. There is a clear, visible need for compensatory education for the disadvantaged, low-income student. Differential funding for schools to make this possible should be available if negative taxes or other wealth distribution systems are not.

From our research it was obvious that many low-income parents felt alienated from the school system. This commenced in the very early years of their daughter's education and was reinforced year after year. Parents care about their children's education but do not feel comfortable about approaching the school. Teachers who slip easily into the role of 'expert' need to examine that and realise that only when parents and teachers work together in an honest and *equal* relationship will the needs of the students be met.

Moves must be made to open schools to parents. It is vital that parents of children who are not achieving should feel free and comfortable to approach teachers at all times. Parents as 'consumers' of the system should have access, by right. Schools should be perceived (and used) as a community resource. The notion that schools belong to the people in the community, especially children and parents, rather than to authority figures (teachers, Board members, and Ministry officials) should be boosted.

Efforts should be made to select teacher trainees who have abilities and attributes suited to meet the needs of children from all *income* backgrounds. Teacher trainees should be paid a livable wage so that recruitment can embrace people-from a variety of socio-economic backgrounds rather than those whose parents have sufficient means to support them during training. Alternately, many high-value bursaries or scholarships should be available and well known.

At the high school level it is crucial that low achievers are identified and programmes that compensate for their deprivations are run. There are different ways of doing this. At this girls' school a home-room worked and worked well.

Other systems, such as mainstreaming, may be used. Whichever system is used, low achievers need a secure, non-judgemental atmosphere. They need a less competitive learning environment and they must stop failing. All students need to feel valued; these students are no exception. How this is achieved is up to the school. But ignoring these children, or pushing them aside, is unprofessional, cruel, and exacerbates present inequities.

A stimulating curriculum for low achievers is needed. It should incorporate (and build on) students' interests and life experiences. However, the utilitarian aspect should not be neglected: students need basic numeracy and literacy skills along with social and survival skills for their everyday lives.

The personal qualities of home-room teachers must include a sensitivity towards the lives of their students. Teachers who cannot appreciate the fact that these students are not inherently stupid and lazy have no place in home-room teaching. The life circumstances of the children must be understood and appreciated.

Notes

Christine Wilson is the home-room teacher at the New Zealand girls' high school where this research was undertaken.

Ann Dupuis is a PhD student in the Sociology Department at the University of Canterbury, Christchurch, New Zealand.

Part of this research appeared as

Wilson, Christine (1986) *Poverty and Education Performance Among Working Class Girls*, Unpublished Research Report, Education Department, University of Canterbury, Christchurch, New Zealand.

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RESEARCH INFORMATION FOR TEACHERS

NUMBER TWO 1992

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item 1

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St. Patrick's College, Campbelltown, NSW, teaches mathematics to the senior classes by bringing all the pupils together for lectures, followed by class-sized tutorials, not all compulsory. John Greene reports how they checked the scheme's success.

4. **Holes in the Mind: Cognitive Development and Cognitive Deficit**
Uta Frith
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Many of our teaching techniques are based on behaviourist experiments of years ago. But behaviour analysis has moved on and discovered that most of what we do is governed by rules we pick up, not experiences we have. A review of what these researchers have discovered.

6. **The Co-operative Reading Resource**
Terry Martin & John Church
140 reading books, developed in his 'spare' time by a reading advisor, use peer tutoring to boost slow readers. Here the resource is explained, and the research that revealed its power.

7. ***Ready to Read* in the South Pacific**
Barbara Moore & Sereima Lumelume
In the South Pacific new approaches to the teaching of English are overdue. Here is one, tried in Fiji, Tonga, Vanuatu and Kiribati, using books not specifically designed for 2nd-language learners. Its impact and success are described.

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David Corson
This article reviews a large body of research on different policy approaches to the curriculum and organisation of actual multi-cultural schools. Bi-lingual and Second-language teaching are particularly noted.

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Paul Wood
Teaching children who are not of our own culture or socio-economic background can be difficult and frustrating. Two researchers working in classrooms have come up with new ways at looking at the differences. There is a section on what to do **now**.

10. **Teacher Evaluation Form - Socrates**
Have you ever thought how some famous people would rate as teachers nowadays? Here is an evaluation form filled in for the most famous of all. The idea came from the American teachers' magazine *Phi Delta Kappan*.

11. **The Crisis in Education**
John Raven
Those who think that the education system should be fostering the competencies that make for enterprise are correct. However, the barriers that need to be overcome are surprising. This item is based on a very wide range of research.

12. **Kindergarten Children Who Cause Concern**
Robin Cook & Jean Wilson
Usually it is unacceptable behaviour that gives cause for concern. For up to 20 percent of children, learning spontaneously is interrupted by their own behaviour. These kindergarten teachers found a way of determining what strategies would help.

13. **Helping One Another Learn**
Gill Thomas
In the present-day classroom children talk to each other a lot. Two items present different, but complementary, analyses of what goes on. In this item very young children's ability to help one another in mathematics is examined.

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In this research the extent of very young children's social interplay and learning about friendship and relationships, even whilst doing mathematics, was revealed.

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Marie Cameron & Lexie Grundhoff
Two years ago the way beginning teachers got a job in New Zealand was completely changed. A ***set*** item in 1990 looked at the changes. Now, two years further on, the latest figures are put through the mill and principals are asked about how the system is working for their schools.

item 2

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Teasing and Bullying

Among Young High School Students

Kym Dickinson
Gladstone, Queensland

Background

AS A SECONDARY GUIDANCE OFFICER I felt that I was spending a high proportion of my time during 1991 counselling Year 8 (Form 3) students as a result of teasing, even bullying. Some of the teasing had led to truanting, severe anxiety, and low self-esteem. In a number of cases, the teasing was having a marked effect on school performance. Unexpectedly, there appeared to be an equal number of boys and girls being teased.

To try to get some figures on the problem, the Year 8 Co-ordinator, the school principal, and I designed a questionnaire which we asked all Year 8s at Gladstone S.H.S. to do in November. The questions were made as open-ended as possible. It is just one page, and can be found at the end of this article. Use it in your school if you wish.

Results

The results of the study were analysed using frequency responses and percentages. From question 5 onwards results were separated for males and females to check gender differences in results. We had 104 boys and 109 girls in Year 8.

Q.1 Sex.

Q.2 Asked if they were doing any teasing, 80 percent said no, 18 percent said yes, 2 percent did not answer.

Q.3 Asked if they had been teased, 87 percent said yes, 13 percent said no.

Q.4 Asked how often they had been teased, the students' replies gave these figures:

Only once this year : 24 percent
Once a month : 19 percent
Once a week : 11 percent
Every day : 17 percent
More than once a day : 11 percent.

This suggests that 39 percent of the students are being teased once a week or more.

Q.5 We asked the girls 'Why do you think people tease you?' Thirty-one percent of the girls thought it was because of appearance or personal characteristics (including weight) or behaviour; 14 percent thought it was being done for fun; 13 percent thought the teaser was at fault; 7 percent thought they themselves were at fault (e.g., 'I'm not good enough'); 5 percent thought the teasers had nothing better to do; 3 percent thought it was peer pressure on the teasers ('acting tough'); 3 percent put it down to failed friendships; 2 percent thought it had something to do with being new to the school; 8 percent said they didn't know why.

We asked the boys who were teased the same question. Twenty-seven percent said it was because of appearance, etc.; 12 percent thought it was done for fun; 10 percent said 'because I tease others'; 8 percent thought the teaser was at fault; and 8 percent thought they themselves were to blame; 6 percent said it was 'something they want to do'; 6 percent mentioned peer pressure; 3 percent said teasers wanted to deliberately hurt; 3 percent said it was because of intellectual ability; 11 percent didn't know.

Q.6 How do they tease you? The girls mentioned:

by calling names (66 percent);
with put-downs (11 percent);
by calling names and physically hitting (9 percent);
with lighthearted teasing (5 percent);
by using obscene language (4 percent);
with physical abuse (3 percent);
by calling names and hurting personal property (1 percent);
by turn friends against them (1 percent).

Therefore 10 percent experience physical harassment or interference with their property - what can be described as bullying.

The boys mentioned
by calling names (58 percent);
with put-downs (14 percent);
by calling names and physically hitting (10 percent);
with obscene language (6 percent);
by abusing personal property (5 percent);
by physical abuse (4 percent);
by 'joking around' (3 percent).
Therefore 19 percent of the boys who are teased are subjected to bullying - physical harassment or interference with personal property.

Q.7 We asked how the girls felt when being teased. They reported:

low feelings (depressed/rejected/etc.) (44 percent);
'O.K. It doesn't worry me' (24 percent);
angry/annoyed (21 percent);
'I ignore it' (6 percent);
'I take it as a joke' (3 percent);
'I like it' (1 percent).

The boys said they felt:
low feelings (38 percent);
angry/wanting to hit (26 percent);
'O.K./don't care' (22 percent);
'It is a joke' (7 percent);
nothing/normal (7 percent);
One boy replied, 'As low as a sunk ship in the ocean.'

Q.8 We asked the girls how they managed: 'What do you do to cope with being teased?'

ignore it (35 percent);
laugh/smile (19 percent);
give a verbal response (12 percent);
make a physical response (10 percent);
tease back (10 percent);
tell someone (8 percent);
try to sort it out (2 percent);
walk away (2 percent);
other (2 percent).

The boys coped these ways:

ignore it (35 percent);
make a physical response (16 percent);
laugh (10 percent);
tease back (10 percent);
do nothing (10 percent);
give a verbal response (7 percent);
walk away (5 percent);
talk to friends/someone (4 percent);
cry (2 percent);
give money (1 percent);
have a smoke (1 percent).

Q.9 Did anyone help them? We asked 'Who can you see or have seen within the school to cope with being teased?' The girls replied:

Combination including one or more of: Guidance Officer/Deputy Principal (welfare)/Year 8 Co-ordinator/office/parents/teacher/friend/older students (37 percent);
no-one (29 percent);
Guidance Officer (17 percent);
friends (14 percent);
teacher (3 percent);
Year 8 Co-ordinator (1 percent).

The boys said they got help from:

Guidance Officer (33 percent);
no-one (25 percent);
Combination including one or more of: Guidance Officer/Year 8 Co-ordinator/school nurse/teacher/friends/administration staff. (20 percent);
friends (10 percent);
Principal (3 percent);
Deputy Principal (3 percent);
teacher (3 percent);
school nurse (1 percent);
Community Education Counsellor – Aboriginal & Torres Strait Islander Counsellor (1 percent);
administration staff (1 percent).

Q.10 The last question asked what the children thought could be done to reduce the amount of teasing. The girls had these suggestions:

change your own behaviour (e.g., don't tease/lose weight) (32 percent);
don't know (23 percent);
nothing/it's natural (11 percent);
give a violent response (punch them) (8 percent);
harsher punishment by school (6 percent);
change others' behaviour (5 percent);
introduce special content into lessons (e.g., understanding differences) (5 percent);
stream children into classes by ability (2 percent);
talk to the Guidance Officer (2 percent).

The boys' suggestions to stop teasing included:

don't know (20 percent);
change your own behaviour (19 percent);
do nothing (18 percent);
give harsher punishments (14 percent);
make a violent response (10 percent);
tell someone (10 percent);
ignore teasers and bullies (5 percent);
change schools (3 percent);
change others (1 percent);
tease others (1 percent).

Discussion of Results

That 39 percent of students are being teased once a week or more, indicates that the problem is more extensive than other studies have suggested. So does the figure of 87 percent of students being teased at some stage during the year. This appears to be a two-way process, however, with 80 percent of students doing some teasing themselves.

The most frequent reason given for teasing by both males and females was appearance. Girls were more likely than boys to externalise responses e.g., to say 'because they (the teasers) are not good enough to be my friends, anyway.' Of concern though, were the internalised responses where both boys and girls indicated that they were teased because of their own inherent personality deficits. These responses indicate very low self-esteem.

The amount of physical violence was of great concern. Although the questionnaire asked its questions about 'teasing', actual violence - bullying - is prevalent. Not only that, but violence is also seen quite often as a 'solution' to the situation. Nineteen percent of males said the form of teasing they are subjected to included physical harassment or interference with physical property. Girls also were subjected to physical assault with 14 percent mentioning physical interference. And many children tried to cope by being physical back. Boys physically responded 16 percent of the time, the second most common response. Physical responses were fourth with girls (10 percent). These figures indicate that conflict resolution skills and assertive behaviour techniques are urgently required to provide alternatives to physical confrontation.

It may appear from the responses that much of the teasing was quite petty. However, it is also clear that there are severe emotional consequences from teasing; both boys and girls put low or depressing feelings as the main things they felt about being teased. Boys were then likely to get angry and hit back whereas girls were inclined to feel okay about themselves, though this was closely followed by angry responses.

It was reassuring to see that most of the students felt they had access to a number of support systems within the school to help cope with the consequences of teasing. It was of concern, however, to note as the second most frequent response (25 and 29 percent) the children said they did not seek help from anyone. The girls (strangely) were more reluctant to seek help, or didn't know where to get it.

A number of students indicated that nothing could be done to prevent the teasing. This reinforces the findings of other research and paints a picture of helplessness and lowered self-esteem.

Further study

If we decide to do a similar survey next year we may add, before the instructions, a definition of teasing or bullying to tighten up the results. A Likert type scale for some of the questions might be a good idea; for example, 'Tick the box that is closest to how you feel when teased: enjoy it ☐ don't mind ☐ do mind a bit ☐ mind a lot ☐ absolutely hate ☐. It would help determine the degree of distress that teasing causes, and how this in turn influences children's motivation toward school and learning.

What Do We Know about Teasing and Bullying in General?

The extent of bullying/teasing

An Australian study in 1990 on victimisation in primary schools found that bullying ranged in extent from 8 to 17 percent. This can be compared with results from Norway and Britain.

Table 1

Approximate percentages of pupils who report being bullied 'now and then' or more frequently.

	Age Group	Norway	Britain	Australia
Being bullied	8-12 yrs	12	17	8 – 17
	13-16 yrs	5	18	–

Bullying is, of course, a more violent form of teasing. Our questionnaire could be said to have found an incidence of 19 percent for boys and 14 percent for girls.

Which factors help to create a bully?

Smith and Ahmad writing in ***set*** No. 1, 1990, distinguish a number of features from research in Scandinavia, Britain and the U.S.A. They say that the research indicates that children who bully others:

> ...are likely to see violence and power as acceptable ways of solving disputes; to have little empathy with victims; and to come from home backgrounds which lack warmth, tolerate aggressive behaviour amongst family members, and exert inconsistent discipline and inadequate monitoring of the children's behaviour.

Tattum and Lane say that that both bullies and victims had learning problems at school. Roberts in her 1988 article described bullies as having a personality that was both dominant and impulsive. Bullies tended to see aggression as an effective means for achieving their goal. Bullies are more likely to interpret behaviour from other students as being aggressive and therefore respond aggressively as a method of self-defence.

Who are the victims?

Victims tend to be unassertive and have a low self-esteem according to the research of both Roberts and Slee and Rigby. However, does low self-esteem result from the teasing or act as the trigger for the teasing to occur? Roberts found victims to be anxious, sensitive, quiet loners. They appeared to have few if any friends. They are possibly over-protected at home, say Smith and Ahmad. A study by Vosk and others in 1982 found that unpopular children spent significantly less time on-task than popular children and also engaged in significantly more negative interactions, for example, off-task behaviour or rejecting other students. This increased their unpopularity.

Consequences for both the bully and the victim

A number of studies have found that there are serious long term consequences for both bullies and victims. A 22-year longitudinal study by Professor Leonard Eron and his colleagues of the University of Illinois found that 8-year-old bullies had a 1-in-4 chance of having a criminal record by the time they had reached 30. This compares with a 1 in 20 chance for the general population. Bullies learn that aggression is an acceptable method of problem solving. As a result they are more likely to be involved in domestic violence and see physical abuse as an acceptable method of discipline for their own children.

Interviews with 98 primary school victims of bullying found that they had a general sense of loneliness and isolation, together with general apathy. In the short term, victims may resort to truanting from school or feigning illness to avoid exposure to bullying and teasing. There have been cases of students committing suicide or killing their tormentor. In the long term, victims are likely to have difficulty forming adult relationships particularly with the opposite sex; self-esteem may be low, which can lead to insecurity within love relationships, according to Smith and Ahmad.

What can be done?

The results of our questionnaire indicate that preventative teaching needs to have a place in the school curriculum, perhaps via conflict resolution and assertiveness training. There needs to be work to develop an empathy and understanding of the value of individual differences. At Gladstone High, reactive systems are firmly in place which help to provide support once teasing has occurred, and the majority of students are aware of these and use them directly. More can be done, however, to ensure that all students are aware of these services.

A number of other options that could be incorporated into an overall pro-active strategy are outlined by Hyndman.

(1) Both teaching and non-teaching staff need to be made aware of the extent of the problem and the seriousness of the consequences both for the short and long term. Teasing and bullying are not just 'kid's stuff' that each child has to undergo in order to develop an adequate moral fibre.

A number of our students said they had reported teasing or bullying in the past and the teacher had not done anything to try and alleviate the situation. They said they had not reported incidents to teachers after that. Teachers act as important role models for students and they need to convey the message that there are alternatives when students are faced with frustration. The type of language they use in the classroom is also of paramount importance and it needs to convey respect, not 'put-downs' or sarcasm, which are, after all, a form of verbal bullying from someone in a position of power. That is, the teacher must not model bullying behaviour.

(2) There needs to be a whole-school approach to bullying. This can be reflected in the school development plan. The ethos of the school will then be one of caring, nurturing and support. Parents ought to be involved in this process to emphasise the multi-faceted, total response to the problem that is needed.

(3) A curricular and extra-curricular approach to bullying needs to be provided. Social skills training provides a number of opportunities to explore conflict resolution alternatives and, by being part of the school curriculum, it is then also viewed by all involved as an important element in every child's education.

(4) Both the bullies and victims can be targeted for intervention. Both can be made part of group discussions that aim to increase social skills. For bullies the emphasis would be on dealing with frustrations appropriately, analysis of the stages of problem solving, and understanding of individual differences. For victims,

the sessions could be about self-esteem, assertiveness training, and cognitive strategies to deal with negative reactions from others.

(5) Simple questionnaire research early in the school year, similar to our own, would help find potential bullies and victims and help to prevent problems arising.

(6) The general school organisation and environment can also play a role in reducing the incidence of bullying. Supervision during break times in places where bullying is likely to take place can do much to reduce its incidence, as this is a peak time for bullying to occur. The work by Maris O'Rourke in a ***set*** item called 'In the Playground' (in ***set*** No. 2, 1987, Item 15, reprinted in the *Best of **set**: Discipline)* is relevant here. It is essential for supervising teachers to intervene in harassing situations rather than to turn a blind eye. Ignoring situations condones the behaviour and reduces the options for the victim.

(7) Finally, as a total response to the problem, it is important for the school to maintain contact with any outside agencies or organisations that are involved with the welfare of the student community.

Conclusion

Bullying or teasing will probably never be totally eradicated from any school. The Scandinavian experience as described by Smith and Ahmad, however, shows that a total approach can reduce the amount of bullying. Any reduction is good in the short and long term for all the stakeholders in the education process.

Our experience, at Gladstone High School, setting up a total approach, beginning with a simple piece of research, has been excellent.

Notes

MS KYM DICKINSON is Senior Guidance Officer, Gladstone State High School, P.O.Box 260, Gladstone, Queensland, Australia 4680.

The Australian 1990 study on victimisation in primary schools is

Slee, P. and Rigby, K. (1991) Victims and bullies in the school setting, *Australian Guidance and Counselling Association Conferences*, Melbourne.

The Table of Norwegian and British figures of the incidence of bullying (to which I have added the Slee and Rigby figure) is found in

Smith, P.K. and Ahmad, Y. (1990) The playground jungle: bullies, victims, and intervention strategies. ***set**: Research Information for Teachers*, No. 1, 1990, Item 6.

That both bullies and victims have learning problems at school is discussed in

Tattum, D.P. and Lane, D.A. (1988) *Bullying in Schools*. Stoke-on-Trent: Trentham Books.

The paper by Margery Roberts is mentioned several times. It contains important material and is

Roberts, M. (1988) Schoolyard menace. *Psychology Today*, Vol.22, No.2, pp. 53-56, February 1988.

That unpopular children spend less time on-task is discussed by

Vosk, B., Forehand, R., Parker, J.B. and Rickard, K. (1982) A multimethod comparison of popular and unpopular children, *Developmental Psychology*, Vol. 18, No. 4, pp. 571-575.

The 22-year longitudinal study by Leonard Eron and colleagues showing serious consequences later in life for those who are bullied or who bully is quoted by Roberts, mentioned above.

That bullies are later involved in domestic violence is discussed in

Hyndman, M. (1991) School bullying: Is it just kid stuff? *Infocus*, Vol. 3, No. 2, pp. 3-4.

That bullies later see physical abuse as appropriate for their own children is discussed in

Irvine, J. (1992) Research suggests hitting kids teaches them nothing but to resort to violence. *Gladstone Observer*.

The interviews with 98 primary school children are from Slee and Rigby, referenced above.

Many of the options for an anti-bullying school strategy come from the article in *Infocus* by Hyndman, mentioned above.

Other useful articles are:

Clark, R.D. (1987) Children and teasing. In *Children's Needs: Psychological Perspectives*. A. Thomas, J. Grimes (Eds.) Washington, DC: The National Association of School Psychologists.

Dallinger, J.M. and Prince, N. (1984) *Teasing: Goals and responses*. Annual Meeting of the Speech Communication Association.

Gerrard, J.M. (1991) The teasing syndrome in facially deformed children, *Australian and New Zealand Journal of Family Therapy*, Vol. 12, No. 3, pp. 147-154.

Library Review (1991) Resources on bullying, Vol. 5, No. 1, pp. 5-6.

O'Rourke, Maris (1987) In the Playground, ***set***, No.2, 1987, item 15; and in *Best of **set**: Discipline*, Wellington: NZCER and Melbourne: ACER.

Phillips, S.U. (1975) Teasing, punning, and putting people on. *Working Papers in Sociolinguistics*, No. 28, Austin, Texas: Southwest Educational Development Laboratory.

Sprick, R. (1981) *The Solution Book*. U.S.A.: Science Research Associates Inc.

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Appendix

Year 8 Survey on Teasing

This survey has been designed to investigate how much teasing is taking place in Year 8. All answers are **confidential** and therefore do **not** put your name on the form. Please answer each question in turn by either circling a response or writing a short description.

1. Sex: MALE FEMALE
2. Have you teased someone this year? - YES NO
3. Have you been teased this year? - YES NO
4. If Yes to 3, how often have you been teased –
   ☐ only once
   ☐ once a month
   ☐ once a week
   ☐ every day
   ☐ more than once a day
5. Why do you think people tease you?
6. How do they tease you? (What do they say or do?)
7. How do you feel when being teased?
8. What do you do to cope with being teased?
9. Who can you see/or have seen within the school to help cope with being teased?
10. What do you think can be done to reduce the amount of teasing or bullying that is going on?

Thank you for your co-operation.

item 3

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number two 1992

SENIOR SCHOOL MATHS UNIVERSITY STYLE

John Greene
St Patrick's College, Campbelltown, NSW

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GILLESPIE 92

John Gillespie

SENIOR SCHOOL MATHS
UNIVERSITY STYLE

THIS IS A CASE STUDY of a different approach to teaching **Senior** Mathematics. We call it LGTTM for Large Group Teaching/Tutorial Model and run it in the Senior School in both Years 11 and 12 (6th and 7th forms). St Patrick's is an independent Catholic girls school of 1000 pupils and 240 are being taught with this new approach.

Mathematics in NSW can be studied in one of 5 courses. The more able students attempt **4 Unit** or **3 Unit** Mathematics, whilst most students attempt the **2 Unit** or **Mathematics in Society** courses. Students with limited success in Mathematics in Junior School attempt **Mathematics in Practice.** The large group teaching tutorial model (LGTTM) at St Patrick's College is used in **3 Unit and 4 Unit** Mathematics, **2 Unit** Mathematics and **Mathematics in Society.**

The LGTTM has 3 modes of instruction: large group lecture, small group tutorial and large group tutorial. The large group lecture, which is compulsory, uses an expository model of teaching – the lecturer explains to the whole group some new process. There is time for some questioning, and in some cases the aim is for a guided discovery approach. It is not unlike an ordinary Mathematics classroom – only the instruction is to a large group, between 30 and 70. Lectures have to be well prepared.

The tutorials, which are not all compulsory, allow for individualised instruction and group work. They are organised as small group tutorials about usual class size, 10-20, or as large group tutorials with one or two teachers available. The small group tutorials have the same teacher at all times and the large group tutorials are staffed with a selection of class teachers.

Table 1

Modes of Instruction for ***2 Unit Mathematics*** *in a Teaching Cycle of 6 Periods*

No. of Students: 70		No. of Classes: 3		No. of Periods: 6
		Teachers required	Staff Saving (Teachers)	Periods Saved
No. of Lectures	2	1	2	4
No. of Small Group Tutorials	3	3	–	–
No. of Large Group Tutorials	1	1	2	2
6 Periods saved out of 3x6 = 18 Periods			33% Staff Saving	

For instance, for three **2 Unit** Mathematics classes timetabled together, all students meet 3 teachers instead of the usual one. (See Table 1). The advantage for students is they are exposed to a variety of teaching approaches, and the advantage for teachers, is that they need to prepare lectures and exercises only once every two or three cycles (depending on timetable organisation).

Since the large group tutorials are not all compulsory, students are able to make decisions and have control over their own learning and behaviour.

Why LGTTM was introduced

Before analysing the success or failure of the approach it is important to look at why the LGTTM was originally designed. Firstly, the mathematics department, after several meetings and staff development days, came to the conclusion that senior students need to be more in control of their learning and to prepare for university style learning. Secondly, since not all teachers are required at each lecture and large group tutorial, teachers would have more release time to prepare lecture materials. The total saving for the department is about 30% of the normal allocated teaching time, (13 periods saved out of 45 time-tabled periods for courses **2 Unit/3 Unit**). Non-contact time is used for preparation or marking or staff development. We certainly did not change to this system to employ fewer teachers! To check that we understood the implications for our senior students we evaluated it, asking for the perceptions of both teachers and students of the learning environment the new model created.

What the literature suggests on measuring environment as a means of evaluation

A review of previous research by Barry Fraser and colleagues in 1989 found that little work had been done on investigating the mathematics classroom environment. The strongest work looked at the effect general classroom environments have on students' cognitive and affective learning and found that the better students liked the classroom learning environment, the more learning took place. More recently a large International Association for the Evaluation of Educational Achievement (IEA) study into mathematics has begun appearing and Volume 3 will contain new insights.

Various questionnaires have been designed to measure the psycho-social environment in the classroom. The most relevant for us was the Individual Classroom Environment Questionnaire (ICEQ). The ICEQ provides a useful tool for monitoring changes and is able to differentiate revealingly between curricula, even when various achievement outcome measures show negligible differences. Barry Fraser, who designed the questionnaire, suggests that it can be used to evaluate senior colleges, where students take on more responsibility for their learning, and where the school ethos is fundamentally different from that of conventional high schools. This was the most important consideration for us.

The ICEQ works by asking the same questions twice – the first time you are asked to say if the statements apply to the actual situation you have in the classroom at present. (**Actual** form.) The second time you are asked to react to the statements as if they applied to the classroom environment you would prefer. (**Preferred** form.) For example, you are asked to say if *Students chose their own partners for group work* (almost never, seldom, sometimes, often, or very often) in your classroom (**Actual**), and how you would like it to be organised in a classroom ideal for you. (**Preferred**).

Our research

The **Actual** and **Preferred** short forms of the ICEQ were answered by all Year 11 **2/3 Unit** Students after LGTTM had been operating for ten weeks (1 term). One hundred and thirteen out of 130 completed the questionnaires. All six mathematics teachers completed the **Actual** and **Preferred** long forms during week 13. Both teachers and students were asked to respond to the whole programme (lecture, small group tutorial, and large group tutorial) and not to isolated parts.

Results and conclusions

The analysis showed that the students felt sure that they are, to a large extent, allowed to make decisions and have control over their own learning and behaviour. This was corroborated by the fact that in both **Actual** and **Preferred** forms their answers were the same – they preferred independence and felt that they were given it. Interestingly, teachers felt the same way. Thus we find that the LGTTM has been most successful – one of the reasons it was begun was to give students control over their learning.

Other conclusions from the analysis of the students questionnaires are that: (1) the LGTTM allows for opportunities for individual students to interact with the teacher; (2) there is concern for personal welfare and social growth of the individual. However, the students **Preferred** answers indicate they would like more personal contact, more participation, and more investigation. We have room to improve on these dimensions.

When the **2 Unit** and **3 Unit** students' **Actual** answers were compared, the **3 Unit** students had a significantly stronger preference for the LGTTM on four dimensions. This indicates both the **2 Unit** and **3 Unit** students know the LGTTM system continues the system of selecting students on the basis of ability, learning style and rate of working and treating them differently. I suggest that the **3 Unit** students have a stronger preference for the LGTTM because more able students respond more positively to a learning environment over which they have control.

The teachers also believe the LGTTM can be improved on all the dimensions except that of encouraging independence. The large majority of teachers are in favour of LGTTM and it is now in operation in both Years 11 and 12 in all the Mathematics Courses.

Other signs of success

Apart from developing independence the LGTTM was most successful in two important areas: **participation rates** at higher levels in mathematics, and, **external examination** results. This showed up most clearly when the pupils who had participated in the LGTTM over 18 months sat for the Higher School Certificate (HSC) in 1991. The HSC is an external examination and in NSW nearly 5,500 sit HSC Mathematics at varying levels.

The participation rates for girls at St. Patrick's in higher levels of mathematics, when compared to state-wide trends for boys and girls in 1991 were excellent. For **3 Unit** Mathematics it was nearly two and a half times the State norm for girls and nearly twice the norm for boys – an astounding result! The **4 Unit** participation rates were also encouraging. (See Table 2.)

Table 2

Participation rates at St. Patrick's College in higher levels of mathematics in 1991.

Higher mathematics level	St. Patrick's College 1991 HSC	State	
		Boys	Girls
3 Unit	38% (n=50)	22%	17%
4 Unit	8% (n=11)	11%	5%

These results in participation rates are most encouraging considering that gender differences exist in course preferences (in favour of boys at higher levels).

When HSC examination results were analysed two comparisons were made: the College's HSC results in Mathematics were first compared to State norms and secondly to previous year's HSC results.

(1) Compared to State norms (for boys and girls) students at St. Patrick's performed on or around the state average in the Higher Levels of **3 Unit** and **4 Unit** Mathematics. The **2 Unit** results were slightly below the State average. Did the fact that the **2 Unit** students preferred the LGTTM less than the **3 Unit** and **4 Unit** students have a bearing on this result? We do not know. State norms for girls only were unavailable at the time of going to press.

(2) Compared to the previous year's College results (for equal candidature) the **2 Unit** and **3 Unit** combined common results showed an improvement of about 2 per cent – most of this coming from the performance of students in **3 Unit** on the **2 Unit** common paper (up about 4 per cent).

In summary the LGTTM produced results on or close to State norms, and in some cases better results than the previous year. It can be deduced that the level of learning was at least as good, perhaps a little better, than our own previous level, particularly for the higher level candidates in **3 Unit/4 Unit** Mathematics.

To conclude, the LGTTM has achieved its primary aim: to allow students to make decisions and have control over their own learning environment. Both teachers and students believe this to be the case. It was interesting to note that contrary to analysis suggested by Fraser in 1989 our study indicated little difference between student and teacher perceptions of independence.

Notes

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The ICEQ is normed for Australian schools and available from ACER

Fraser, B. (1989) *Individualised Classroom Environment Questionnaire*, Victoria: ACER.

The review of research on classroom environment is

Fraser, B., Malone, J. and Neale, J. (1989) Assessing and improving the psychosocial environment of mathematics classrooms, *Journal for Research in Mathematics Education*, Vol. 20, No. 2, pp. 191-201.

The large IEA survey, with Volume 3 on classroom processes and mathematical growth still to be published, is

Travers, K.J. and Westbury, I. (Eds.) (1989) *The IEA Study of Mathematics I: Analysis of Mathematics Curricula*. Oxford: Pergamon.

Robitaille, D.F. and Garden, R.A. (Eds.) (1989) *The IEA Study of Mathematics II: Contexts and Outcomes of School Mathematics*. Oxford: Pergamon.

Further reading on classroom environment research:

Fraser, B. (1989) Twenty years of classroom climate work: progress and prospect, *Journal of Curriculum Studies*, Vol. 21, No. 4, pp. 307-327.

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Hankoos, G. and Penick, J. (1983) The influence of classroom climate on science process and content achievement of community college students, *Journal of Research in Science Teaching*, Vol. 20, No. 7, pp. 629-637.

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Sadker, D. and Sinclair, R. (1977) Dimensions of the elementary school educational environment: A factor analytic study, *Journal of Classroom Interaction*, Vol. 2, No. 2, pp. 27-30.

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Other questionnaires etc., on classroom environment include:

Moos, R., and Trickett, E. (1974) *Classroom Environment Scale Manual (listed)*, Palo Alto, California.

Fisher, D. and Fraser, B. (1981) Validity and use of my class inventory, *Science Education*, Vol. 65, No. 2, pp. 145-156.

Fraser, B. (1989) *Individualised Classroom Environment Questionnaire*. Victoria: ACER.

In the comparisons of the College's HSC results with State norms and the previous year's results, for statistical relativity, equal participation percentages were used. The previous year had not experienced LGTTM.

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item 4

set research information for teachers
number two 1992

HOLES IN THE MIND:
COGNITIVE DEVELOPMENT AND COGNITIVE DEFICIT

Uta Frith
MRC Cognitive Development Unit, London

Shona McLean

ARE THERE SUCH THINGS as holes in the mind? There certainly can be holes in the head, and these can lead to not thinking properly. Not being able to think properly is a major handicap. We all know of people with minor difficulties, for example loss of memory or an inability to spell, and others with major difficulties, for example, people with Down's syndrome or Alzheimer's disease. These handicaps can be called **cognitive** deficits; they are in fact, holes in the mind.

These inabilities are caused by things wrong in the brain. They can be caused by, for example, defects at birth, inherited defects, accidents that cut or destroy lobes of the brain, and so on. We can call these **biological** deficits.

Some of the cognitive deficits can be overcome or circumvented – we grow, we develop and we learn. The biological deficits are, as far as we know, fixed – we cannot grow a new lobe on our brain, nor change a set of nerve cells our genes have given us. If we do manage better than expected it is because a different part of the brain has taken over the job which the hole – the 'damaged' part – cannot handle.

The signs and symptoms of brain damage are highly variable and we see them in behaviour, not in read-outs on machines. So the signs are changed and muddled by ordinary growing up, by learning, by experience, by compensation, and by motivation. In this article are illustrations from two forms of cognitive deficit you may come across in your classroom, particularly where handicapped children have been mainstreamed or integrated. If there are holes in the mind, then teaching makes a lot of difference. But the way to teach in this case must be informed by a clear understanding of the problem.

Some technicalities

As teachers, for the sake of our pupils, and their learning, we need to know about thinking, knowing, and feeling. These are the subjects of cognitive psychology.

Where do thoughts, knowledge and feelings come from? (This is *the* question of cognitive development.) The question is almost impossibly difficult, but it has one answer that is very simple: the development of the mind comes from the development of the brain.

Reproduction and growth are hazardous processes. Minor problems in brain development can occur so early in life that the very course of mental development is set onto a deviant path. Later intervention with social or other environmental means cannot completely reset this path, though it can certainly smooth it. An example which highlights the three most important aspects of this kind of developmental disorder is congenital cortical blindness. First, there is a deficit which cannot be made good; second, development ensures that there is growth and learning in all unaffected areas; and third, there is adaptation to the deficit, much of which can be supplied in the form of special tools, like Braille, and compensatory education.

By studying the effect of abnormality on development we can get a glimpse into the inner workings of this deeply hidden process. In normal development everything goes together with everything else: learning to walk goes together with learning to think, to socialise and to communicate; just as it goes together with physical growth. Development is under some powerful central control and takes its inexorable course regardless of attempts to help or hinder it along its way. In this pattern of global change the existence of separate components can only be guessed at.

The two examples of developmental disorders that I have studied, autism and dyslexia, both arise from some subtle brain abnormality, occurring probably well before birth. Of course, these disorders are very different from each other; with different causes and effects, autism being by far the more severe. However, in each case there is a wide range of characteristic behaviour which, when it is recognised for what it is, will help detect and diagnose the disorder.

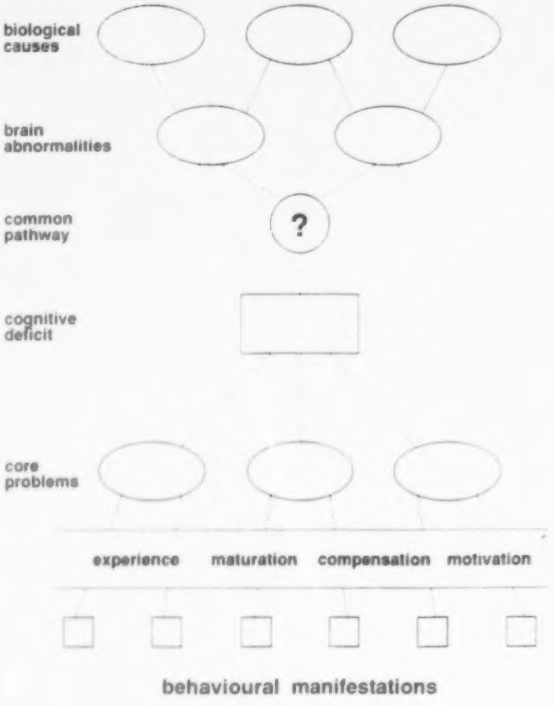
Theoretical considerations

For a long time anatomical evidence for brain abnormalities in autism and dyslexia did not exist and consequently biology tended to be ignored in psychological accounts. Now such evidence does exist, but further technological advances, such as brain imaging processes, will be necessary in order to identify exactly what damage, in what brain system, at what point in development, causes these disorders. We still have to guess about it a fair bit.

Would it be wiser then, to reserve judgment? Perhaps these disorders have purely social-environmental causes? Such 'caution' has dangerous consequences, since it influences prevention and treatment. Simply because we do not yet know the precise brain dysfunction responsible does not mean that we should ignore biology.

Clearly, we cannot jump straight from holes in the head (brain defects) to behavioural problems in one leap. The following model suggests possible bridges.

Figure 1
Developmental Disorders: Model



Children with severe and obvious mental impairment from birth are studied by few researchers. Yet they hold the key to the problem of how brain abnormality affects the development of the mind. These children are the unfortunate victims of brain damage so pervasive and so early in life that all aspects of their mind and the whole of their development are blighted. The consequences for mental and physical functions are often devastating. Yet here too we find the powerful effects of maturation, experience and, if damage is not too extensive, compensation.

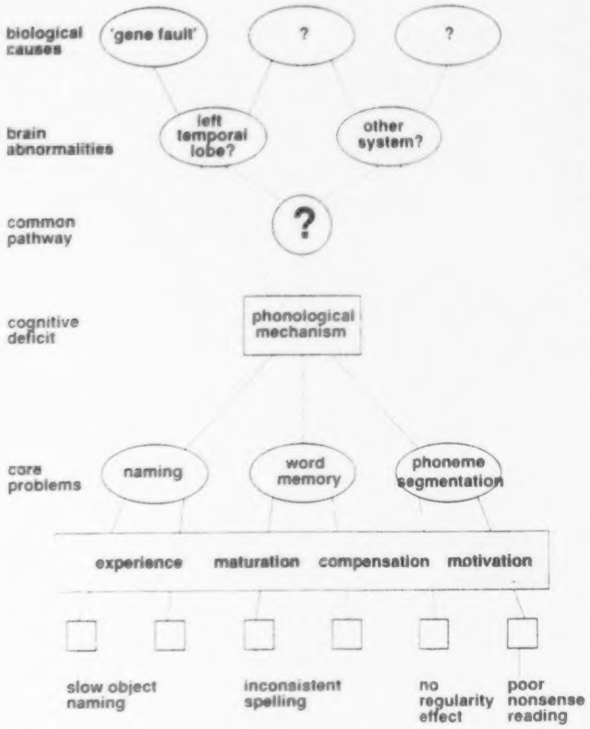
Autistic children are just one subgroup of this large group of severe developmental disorders. However for autism to result, the damage appears to affect just one particular component of the brain – and hence of the mind. It is difficult to disentangle specific and general deficits; holes in the mind often mean that the whole system cannot work properly. Nevertheless it is possible to spot, sometimes, a single culprit for even widespread problems. By finding single sorts of behaviour which are anomalous (where you might have expected a whole set of generally disordered ways of behaving) cognitive deficits can be pin-pointed.

So we need a theory. I am delighted to quote Agatha Christie, who advocated that observation must be guided by theory. In the Sittaford mystery the young heroine has just presented her theory to her boy friend:

> 'It's awfully ingenious' said Charles, 'but I don't believe for a minute it's true'. 'We'll assume that it is true', said Emily firmly. 'I am sure that in the detection of crime you mustn't be afraid to assume things.'

I quote this little scene because I find it very encouraging. The detection of crime and the detection of cognitive deficits (which are, so-to-speak, crimes of nature) are much the same. The encouraging part is that Emily was completely wrong in her assumptions, but if she had not made them, no progress in the investigation would have been made.

Figure 2
Dyslexia: Model



Dyslexia

I shall now turn to the example of dyslexia, as illustrated in Figure 2. How can we distinguish reading and spelling failure which is due to a problem inside the child's mind (from birth) from a failure which is due to a problem outside the child's mind? There are, after all, at least a dozen blindingly obvious causes of problems with literacy that have nothing to do with holes in the mind.

One hypothesis about the underlying cognitive deficit in dyslexia is that there is a problem with a single component of the mind's analysis of speech sounds. This idea rests on the convergence of a large body of work carried out in several different countries.

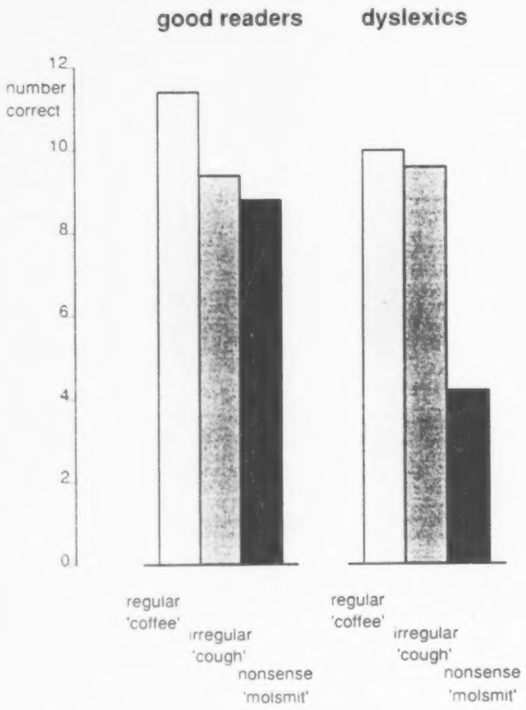
In Figure 2 we can see exactly what this theory entails. First, there are various suggestions for affected brain functions in dyslexia. We don't know which it is, but any of these would lead to the specific cognitive deficit proposed. In turn, this deficit in phonological processing, or handling of speech, would lead to various core problems. Naming objects, short-term memory and phoneme segmentation, would certainly be impaired. It is important to note that these problems are not directly concerned with reading and writing. The link here is phoneme segmentation, since learning to read and write in an alphabetic script depends on this ability. It should be possible to detect and diagnose dyslexia before the child starts learning to read – and before being exposed to failure at school. Such diagnosis is as yet a task for the future.

The model suggests that, having been given poor speech-handling skills, dyslexic readers will be very poor at non-word reading, but not necessarily so at word reading. Words, as long as they are familiar and have been memorised as visual patterns, can be recognised by visual means, and this can be a way of compensation. Non-words, which are seen for the first time, have to be decoded into speech sounds, and this is precisely where the problem is.

Maggie Snowling and I tested this hypothesis. We looked at a group of dyslexic children who, with good teaching, maturation, experience and motivation had reached a Reading Age of 8 to 10 years at the chronological age of 10 to 12. We were willing to bet that, nevertheless, they would show tell-tale signs of their underlying deficit. We expected that they would not have acquired the facility in alphabetic skills that is essential for the fast letter-to-sound decoding of novel words. So it turned out. Novel and strange non-words were unduly difficult for them, but they could cope well with familiar words.

Furthermore, it did not seem to matter whether a word would be called regular or irregular: for the dyslexic all spellings are peculiar, including those which can be produced by regular alphabetic principles.

Figure 3
Reading Words and Non-words in Normal and Dyslexic Children
(Based on Frith and Snowling, 1983)



From the model we could also make the prediction that dyslexics make many spelling errors that do not follow phonetic principles, but arise instead from less than perfect visual memory images. Seventy-five percent of good spellers who got the word cough wrong wrote cof – a spelling that follows the sound of the word. Only 20 percent of good spellers wrote couge, or something like that, that gets close to the look of the word.

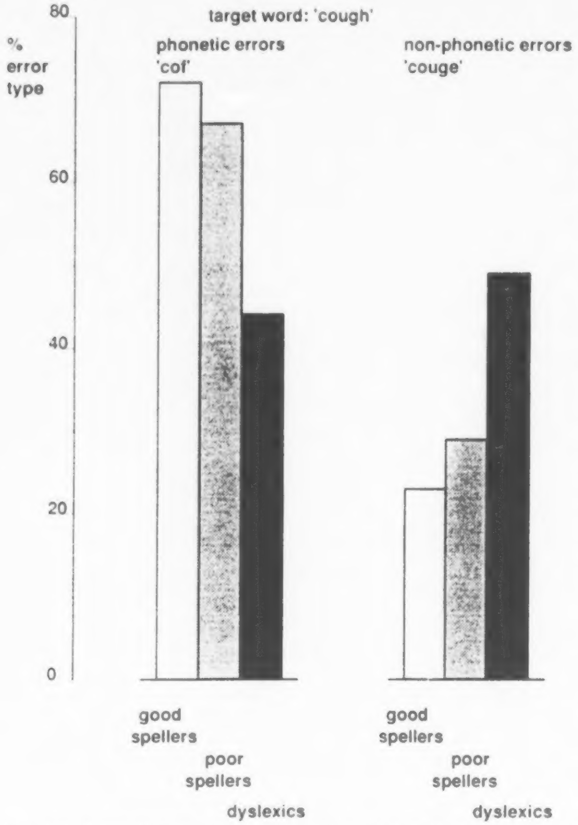
'Ordinary' poor spellers did much the same, only 20 percent writing something that looked approximately right, 80 percent writing something reasonably phonetic. 'Dyslexic' poor spellers however wrote something like the look of the word as often as something like the sound of the word.

Figure 4 presents a comparison of poor spellers and dyslexics showing that the groups can be differentiated in just this way.

Figure 4

Types of Spelling Errors Made By 12-Year-Olds

(Based on Frith, 1980)



The third prediction of the general model is that dyslexics should have problems with naming and short-term memory as well as with the manipulation and segmentation of phonemes. This has in fact been shown independently by several researchers. When all the problems are found in the same child, then this looks like more than coincidence – we could wager that the child fails educationally because he or she has a hole in the mind.

Where does this leave the teacher? Clearly it is not the case that dyslexic children do not acquire any skill with alphabetic material. Very often they do – though sometimes by near superhuman effort. More than other developmental disorders dyslexia is marked by high degrees of compensation. Surface behaviour in the older and well motivated dyslexic child can be extremely deceptive. Such a child can be a good reader having acquired a large sight vocabulary and a hard-won measure of alphabetic skills. Such a child can also become a phonetic speller. Appearances can be deceptive. These compensated children have to keep themselves on their toes at all times and are therefore vulnerable to stress.

Of course, non-dyslexic people may also have problems. Getting something wrong today can be for reasons other than an underlying cognitive deficit. The problem might be due, in one instance, to inadequate teaching, in another, to a lack of motivation, and so on. Here it is important to recall that the definition of dyslexia, as a syndrome, is at the cognitive level and not at the behavioural level. The existence of reading and writing difficulties need not necessarily signal dyslexia. What will signal dyslexia will be the case where most behaviour is 'ordinary' but where just those special abilities (such as managing nonsense words) are missing, that is, abilities that depend on one mental component that is damaged. Where we do not find this particular set of special abilities missing, we will not suspect a phonological deficit, but perhaps a more general problem instead.

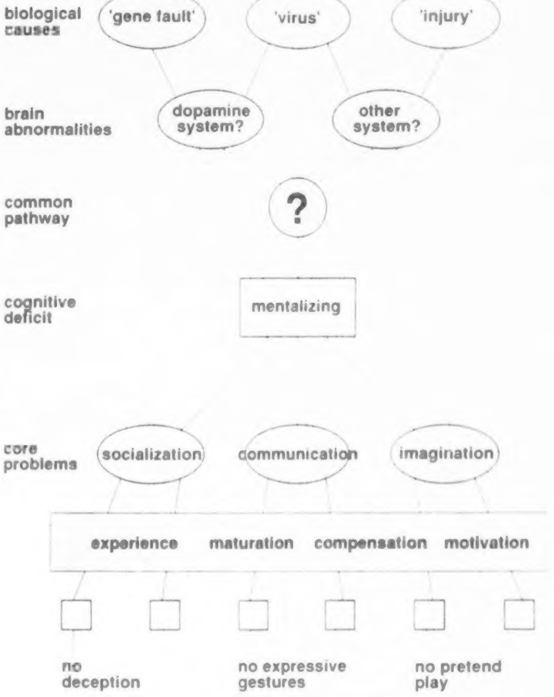
It seemed straightforward to identify a specific cognitive deficit for dyslexia, which after all is famous for being a specific disability. In fact, it has proved extremely difficult to pin down the deficit, and it is still far from clear how to conceptualise the phonological mechanism in question. It is also not yet clear what we should regard as the core symptoms of the syndrome. The difficulty for the teacher and researcher alike is not being able to look directly at the underlying deficit. So often what we see is hopelessly obscured by other factors.

Autism

In the case of autism, the task of identifying a specific cognitive deficit appeared, initially, extraordinarily difficult. Far from the expectation that there would be a single specific deficit to account for the complex pattern of symptoms, there was the strong possibility that autism was a typical example of multiple deficits. Indeed, the most widely used diagnostic descriptions classify autism as a pervasive developmental disorder rather than as a specific disorder. However, it is in the case of autism that the search for a cognitive deficit has been most successful. We have come up with the following model.

Figure 5

Autism: Model



The core symptoms of autism have been well established by epidemiological and follow-up studies. They form a triad of impairments in (a) socialisation, (b) communication, and (c) imagination which persist throughout life. The way these impairments are modified by development is very various. Thus there is no definitive behaviour that would once and for all serve as markers for autism at any point in time. Likewise, there are as yet no biological markers. However, we can explain the triad of impairments by the hypothesis of a single cognitive deficit.

Figure 6

Example of 'Behavioural' Sequence

(Based on Baron-Cohen, Leslie & Frith, 1986)

'The girl was buying sweets.'

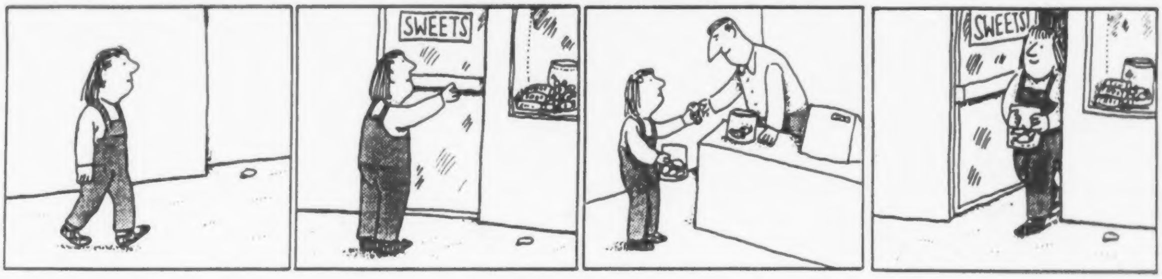
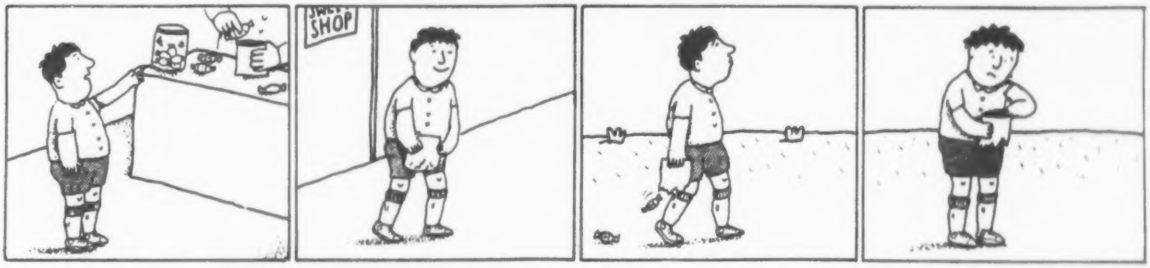


Figure 7

Example of Sequence Involving 'Mentalising'

(Based on Baron-Cohen, Leslie & Frith, 1986)

'The boy *did not know* there was a hole in the bag.'



The deficit concerns a mental component that has to do with representing mind itself. This component is responsible for an ability that we termed **mentalising.** It is also responsible for what has been called an 'everyday theory of mind', or 'folk psychology'. We are intensely aware of having thoughts ourselves and of other people having different thoughts. Attributing thoughts, beliefs and feelings to other people is our normal human way. In our research we discovered that autistic individuals lack this awareness.

The research technique is again one of trying to separate out components of cognitive processing that otherwise seem to belong together; finding the few, special, specific disabilities that at first seem to be just part of a general pattern.

Here is our classic case. There are plenty of others but this is a key one. The Figure 6 cartoon sequence can be mixed up (on 4 separate cards). Autistic children will arrange them into the proper order as easily as normal children. Down's syndrome children do not do as well.

The Figure 7 cartoon sequence is even easier for normal children, about the same for Down's syndrome children, but very very difficult for autistic children.

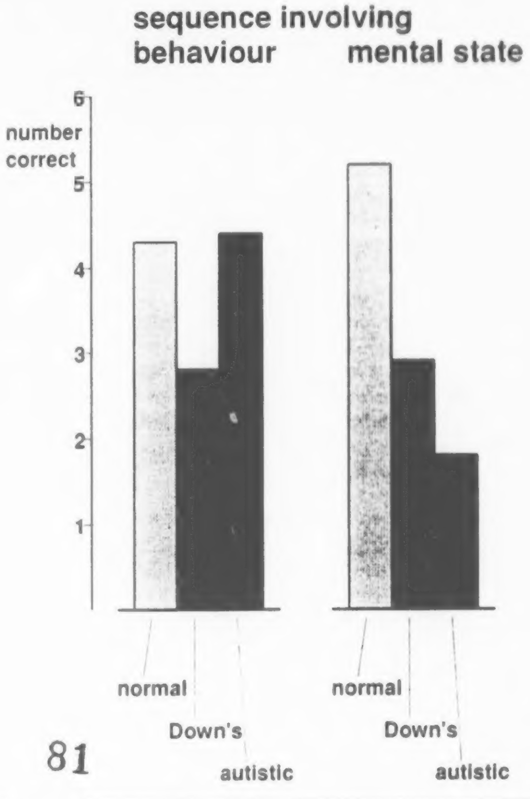
What is the difference? In the second you have to get into the mind of the boy and realise that he doesn't know the sweets are leaking out.

The results of experiments such as this never show a total failure in the autistic group (aged between five and 20 years), nor a 100 percent success in the control groups (non-autistic mentally handicapped children of similar age, and normal children aged three to five years). This is because test performance is influenced by many different factors; experience, motivation and compensation, are only some of them. We must remember that each test is only a remote probe launched towards the cognitive capacity that it is designed to assess; we are measuring performance at the behavioural level, but we cannot measure directly the underlying ability at the cognitive level.

Figure 8

Sequencing Performance in Autistic Subjects and Controls

(Based on Baron-Cohen, Leslie & Frith, 1986)



Autistic people who succeed on some mentalising tasks demonstrate how experience and compensation may camouflage a deficit. We do not yet know, but are currently investigating, whether in these cases the deficit is still there, whether its manifestation is modified by favourable factors, or whether there is a mild form of the deficit.

Discussion

The general implication of the studies is that the monolith of the mind can indeed be broken up. The study of abnormal development allows us to discover specific components that have long been hidden. Theories about different components of the mind guide us to discover separate components in the otherwise smooth continuum of behaviour. Without a cognitive theory every behaviour shades into every other. Individual differences in behaviour of a perfectly normal kind merge smoothly with variable behavioural signs that are due to cognitive deficits.

We can find normal children who make as many or more spelling mistakes as children suffering from a specific phonological deficit leading to poor alphabet skills. We can find normal individuals who find it so difficult to engage in reciprocal affectionate relationships that they compare unfavourably with some autistic people who have an earnest desire to make friends.

What we have done is form a theory of how the mind works, how thinking takes place. We have displayed this theory in a model and tested it by looking for differences in behaviour it predicts. We do not have the tools, yet, to look into the way the brain works.

Of course, besides dyslexia and autism there are other developmental disorders that are due to specific cognitive deficits, for instance language impairments and motor coordination disorders. There are also many disorders of behaviour in childhood that are not biologically caused and that are not due to specific deficits. We do not wish to excuse *all* problem behaviour by holes in the mind! Let us not forget that developmental problems can be caused by a large number of adverse circumstances, none of which have their origin inside the child's mind.

Conclusion

We started off with the metaphor of blindness for specific and congenital developmental deficits. Dyslexia can be seen as word-blindness and autism as mind-blindness. The metaphor is helpful as a means of thinking about the education and management of children suffering from a disorder whose origin is in the brain. Clearly, it would be foolish to make a blind person embark on a programme of eye exercises. But it would be wise to do something about dangers to the blind, such as head-level obstructions, hot surfaces, unfenced cliffs and swimming pools. People can be made mindful of the needs of the blind person, and the physical environment can be adapted so as to be safe for someone who cannot see.

Exactly the same applies to people with word-blindness or mind-blindness. We would be foolish to exercise dyslexics' eyes. But we know that practice with the right aids, such as special books and computer programs, may help the mind find a way to deal with the problem. At a biological level, perhaps the brain is being helped to find unusual, but adequate, sections of the cortex to handle the necessary processing.

Is it unkind to speak of a 'deficit' in the mind? On the other hand, is it kind to treat a handicapped person as if they were fit and healthy? To me it is a very false idea of kindness not to acknowledge that someone, through no fault but nature's, suffers from a biological disorder. Surely, to recognise that some people have a disorder means to recognise that they have a right to an allowance being made for their handicap. This is at least a first step towards kinder treatment, and in school, to better learning.

It is not kind to pretend that people are not blind when in fact they are. Nor is it kind to push people if there is little spare capacity. Compensation is a costly process. When mental resources have to be marshalled where they are sparse, then one should think twice about insisting that they are used for your particular demands.

There are some remarkably optimistic implications from the concept of cognitive deficits in developmental disorders. For example, once the deficit has been recognised – it can be left alone. There is little point in digging in the whole if this only makes the hole deeper. Perhaps it is better not to nag the poor speller. Compensation and diversion into other fields are often possible – but not always necessary – maturation and natural development may find a way. Rather than demanding of handicapped children that they make continuous efforts, we should learn to recognise their often heroic struggle. We can respect the difference between us.

Notes

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The basis for this ***set*** item was the President's Award Lecture, 'Cognitive Development and Cognitive Deficit', published in *The Psychologist: Bulletin of the British Psychological Society*, Volume 5, pages 13 -19, January 1992.

The theory of the triad of impairments in autism being explained by a single cognitive deficit was worked out and tested at the MRC Cognitive Development Unit with the collaboration of Tony Attwood, Simon Baron-Cohen, Francesca Happe, Sue Leekam, Alan Leslie, John Morton, Josef Perner, Amitta Shah, Fran Siddons, Beate Sodian, and Laila Thaiss.

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Figures 6 and 7 are reprinted with kind permission from Axel Scheffler. Both are reprinted from

Frith, U. (1989) *Autism: Explaining the Enigma*. Oxford: Blackwell.

Further Reading

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item 5

set research information for teachers
number two 1992

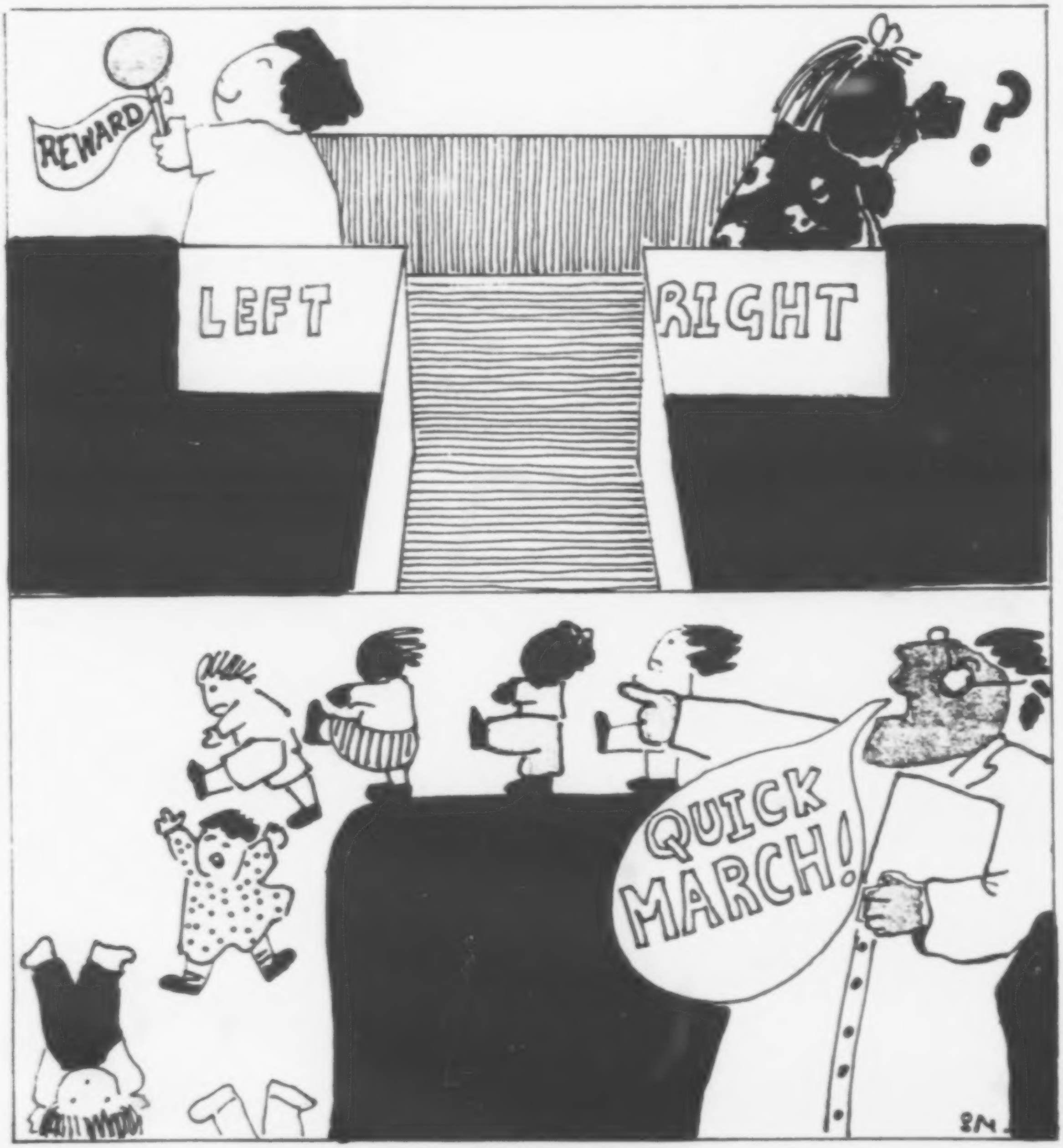
Rules, Rules, Rules

Our Rule-governed Behaviour and Its Implications for Teaching

A Review of the work of

A. Charles Catania, Byron Matthews and Eliot Shimoff

University of Maryland, Baltimore County


REWARD
LEFT
RIGHT
?
QUICK MARCH!
SM

Shona McLean

Rules, Rules, Rules,

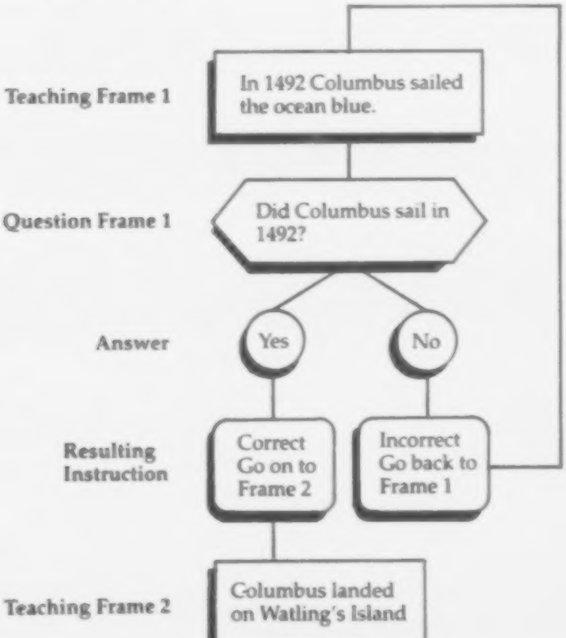
Our Rule-governed Behaviour and its Implications for Teaching

SCHOOL TEACHERS have an unspoken question always lingering in their minds: how do we learn? If only that question could be clearly answered then the classroom and the lessons could be arranged so that everything made learning easy for each child.

To the researcher the question 'how do we learn?' is a fascinating puzzle. Different scientific techniques have been applied to test various learning theories. At worst the answer has been 'It's very complex, we need more research...' At best the answer has been 'Try this, it worked in these circumstances.' And, of course, researchers have disagreed about how to do the research; what counts as a proper scientific approach; what is acceptable evidence that learning has actually occurred; what particular results are generalisable to all learning ; and so on.

One group of researchers took a particularly strict line on what counts as learning. These were the early behavioural psychologists. They argued that the only way to study learning was to study changes in behaviour.

Theirs is a very pure (and some would say restrictive) view of how to study people. It leads to a particular way of describing what people do, and to a particular jargon. But it has been very influential in learning theory. For example, almost all computer-aided instruction packages are directly descended from earlier attempts to use books and teaching machines whose methods follow behavioural assumptions about learning. In the simplest form you have something like this :


Teaching Frame 1
In 1492 Columbus sailed the ocean blue.
Question Frame 1
Did Columbus sail in 1492?
Answer
Yes
No
Resulting Instruction
Correct Go on to Frame 2
Incorrect Go back to Frame 1
Teaching Frame 2
Columbus landed on Watling's Island
etc.

Modern computer assisted instruction is infinitely more sophisticated than that! But it is based on the same assumptions about learning. Most curriculum plans are also based on behavioural learning theory. Any plan which suggests incremental learning steps, frequent revision, frequent testing, frequent reinforcement of skills, is almost certainly following a behaviourist learning theory model. What they have in common is the observation that *we learn the different consequences of what we do.*

Behaviourist learning theory is based on strict observation of what people do. Also, early on in this branch of science, it was realised that less intelligent animals, would probably learn simpler behaviour, but might learn it in the same way as humans – by its consequences. They therefore watched what laboratory animals, such as rats, pigeons and apes do, hoping it would point to the underlying ways in which humans learn. Certainly you cannot ask animals what they are thinking – you can only observe their behaviour.

So hungry rats were popped into T-shaped mazes which had food at the end of one arm, and watched; pigeons were given targets to peck, some of which released food; and apes were given puzzles to work out, such as how to reach a banana with two sticks that fitted together.

Ratty turned right and stayed hungry, turned left and found food. After a few trials she always turned left first. The pigeon after random pecks at a square target and a triangular one was soon pecking every time at the one which released food. The ape, once she had got the knack, tried fitting all sticks together.

The animal experiments got much more complex and subtle but trials with humans produced much the same results : children learnt well if the task was broken up into small steps, if there was good motivation, if there was repetition. These three steps are the basic building block of much of present day teaching: progression, repetition, reinforcement.

The idea of reinforcement has been greatly expanded at a practical level – we know that reward is better than punishment; that reward may be in the skill or knowledge itself, or external, like a chocolate fish for doing the dishes; that feed-back is a sort of reward; that reward promised in the future is seldom as strong as immediate reward; that peer approval is a strong reward, as is adult approval at most stages of childhood.

However, behaviourists have not stopped examining human behaviour and human learning since those early theories of learning were expounded. Skinner and others have taken them further on. At least two paths ahead have been discovered. One is a simplification of learning theory: the other is a major complication.

Behaviour is sensitive to its consequences.

The behaviour of Ratty and the pigeons, even of the apes, can be summed up that way. For Ratty, turning right brought the consequence of continued hunger, turning left brought the consequence of sating that hunger. So

Ratty, sensitive to the consequence, turns left each time. Similarly the pigeon, finding the consequence of pecking the square is getting no pellets, and of pecking the triangle is getting pellets, pecks the triangle.

For humans too, behaviour is sensitive to its consequences. 'The burnt child fears the fire', we say. And small investors, caught in the share market crash, give up buying shares and invest in government bonds or gold bullion instead. But we carefully say, 'the burnt *child*', not, 'the burnt *adult*.' The adage is usually used when we are tut-tutting over some foolish adult who didn't watch out for the consequences – the speculative investor who lost once but didn't learn and lost again. 'Even a *child* knows that!' is the implication. Why did the investor not learn from his or her mistake? This is the second discovery of behaviour analysts lately.

Adult behaviour is rule-governed

Adult behaviour is not (as they put it) contingency-shaped. In fact most of our behaviour – what we do – is governed by rules, instructions, commands, precepts, (what the behaviour analysts call verbal behaviour) not by consequences. And this from about the age of 5.

Bentall, Lowe and Beasty in 1985 studied the performance of children from about 2- to 5-years-old on simple tasks such as button presses, rewarding them with snacks or the chance to hear music. Children under 2 behaved in ways not substantially different from pigeons: their behaviour was contingency-shaped (as the jargon says). Between 2 and 4 (sometimes 5) the children's actions were transitional, sometimes related to consequences, sometimes to rules such as verbal instructions or suggestions. By the age of 5 most children had become almost exclusively rule-governed, taking little notice of the consequences of their actions if they were doing as they were told, in other words, having the relatively stereotyped, inflexible reaction of adults.

Have you noticed that, as an adult, your actions are rule bound and hide-bound (inflexible) too? It takes a bit of getting used to. But if you look back you will see how few things we do without some verbal prod. Of course there are the automatic life preserving actions like suckling when we were babies, breathing, blinking, and our heart goes beating on. But what else? Were you burnt before you learned to treat fire with care? Probably. Were you run over before you learnt to stay off the busy road – probably not.

We learn most of what we know about how to behave from words, not from experience. For example, if you are a teacher out on the sports field with your class, blowing your whistle will stop the game. You may have picked up the connection between the whistle being blown and the game stopping by watching games as a youngster. But when to blow, and when not to, is a part of every referee's course, and it is explained in words, citing the rules.

Using rules

There is a great deal of sense in using rules rather than direct experience of the consequences. The consequences of human actions are often far away: it takes nine months from conception to birth; that twice-times-table Julia is learning now will be needed when she sits her degree exams in 15 years time; troubles in Moscow affect wool prices in Melbourne and Dunedin; the French nuclear test that put radiation in your milk was 6000km away. And imagine if we had no rules about traffic and had to find out each morning, by trial and error, which side of the road was safest to drive on today.

However, for us, rules sometimes run stronger than they should – we go on following a rule when the consequences should be teaching us that the rule is wrong. It is a bit like crossing an unmarked border between Thailand and Cambodia and finding that the truck coming towards you keeps edging further onto 'your' side of the road. Your Thai 'keep left' rule is quite wrong for Cambodia where they 'keep right' and the consequences of sticking to your rule may be disastrous.

Teachers will know of many examples where a child has a 'rule' and applies it despite it failing to work. Perhaps the child thinks that you always need a second 'e' to change the sound of the first 'e' so thinks 'seat' should be spelt 'sete', and can't work out 'elephant' with its two 'e's' at all. Or another child thinks that gravity only works on the earth and not on the moon. Or another that 2 + 3 x 4 = 20 because you always read from the left...

The Buttons and Lights experiment

Behaviour analysts at the University of Maryland, Baltimore County, have been doing experiments that look at the ways we follow rules when we should be following consequences. Several experiments asked college students to try to win points at games that are somewhat like simple games in an amusement arcade. However, in these cases the way to win was not clear and no verbal help was given. The results give an 'upside-down' lesson to teachers since what the players 'learnt' was mostly wrong.

The Buttons and Lights experiment gave the students two buttons to push to control two lights. If you got the light beside the button to come on, you 'scored'. Each score earned you points and points earned money. There was a good incentive to get it right!

For the left-hand button the computer allowed a random number of presses to pass, then lit the light on the next press. You could have no idea how many presses would be needed next, to get the light, since the computer made that random. There was no 'rule' to learn about how many presses, but you could score well by pressing many times, as fast as possible.

For the right-hand button the computer checked the passage of time and gave the reward (lit the light) when the next press came after a random number of seconds, different each time. There was in fact no way of working out a good way of getting the right-hand light to shine; pressing fast was just as good as pressing slow.

After the students had had a session with the buttons and lights they filled in a sheet with sentences to be completed, such as,

> *The way to earn points with the left button is to* ________
>
> ________________________________

These 'guess-sheets' were forcing the students to make-up 'rules' about how the buttons and lights worked. But there weren't any obvious rules. The computers saw to that by introducing randomness. However, the researchers with their guess-sheets were implying that there were rules to be discovered. To make the process even more deadly the researchers gave points (and therefore money!) for some of the answers on the guess-sheets. This they called 'shaping the players' verbal behaviour.' They didn't give points for correct answers. They gave points if the player seemed to be moving towards a rule, from a general one to a more particular formulation about whether to press fast or slow. For example, if one student guessed

> *the way to get points on the right button is to press it at a certain time;*

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then guessed

> *the way to get points on the right button is to press it slowly at a certain time;*

then she got points for that 2nd guess. The second guess was a refined version of the first.

The result was that the players, in the next sessions, followed the 'rules' they had 'discovered', especially those the researchers had 'shaped' by rewarding a guess-sheet. This was despite the fact that some rules (like the one above) could *reduce* the earnings. The players should have been learning from the evidence that their 'rules' were wrong, but they didn't learn this.

Lessons

The Buttons and Lights experiment might remind us of the famous/infamous experiment of Stanley Milgram who found that most people will administer dangerous electric shocks to others if they are told to do so by people in authority, or people they respect. In the Buttons and Lights experiment there was only a harmless game to play. No-one got hurt or even seemed to be hurt. The only thing dented at the end was the students' assumption that researchers are unlikely to lead them up the garden path.

However, there are a lot of lessons for teachers.

For teachers

Perhaps the first lesson is that we have a strong moral duty not to fool our pupils about our intentions or the 'facts' we lay before them. They are learning all the time, especially when working things out for themselves, and to make it difficult for them to know when to believe us and when not, would be a real disservice to the children and society. It's bad enough not being able to trust used-car salesmen and politicians; not being able to trust teachers would be devastating.

However, it must also be a teacher's job to inculcate a healthy scepticism about what we are told. Think of it as the skill of knowing when to believe our eyes (what we have checked out for ourselves) for rather than our ears (what we have been told).

This is not just on moral or political issues. The child who has a wrong rule about 2+3x4 is going to find it difficult to work from the evidence; the evidence is getting crosses, not ticks beside her sums all the time, and a D minus grade in her exam at the end of the term. There is nothing in this evidence to teach a new rule – do the multiplying before the adding.

Where do we get rules from? As the button and lights experiment shows, we get them from other people, and we make them up for ourselves. But even when we make up rules from the evidence in front of us this is often affected by what we are told.

Shaping

Teachers often prefer not to give a rule or command directly but to point out the evidence or the consequences and leave it up to the children to make up their own minds. An example at home might be saying, 'It looks like rain,' but leaving unspoken the conclusion, 'Take an umbrella.' In class it might be, 'Marco Polo travelled eastward, Columbus travelled west, what did they find?' with the pupils left to work it out. Or, 'The opposite angles are equal.' with the consequences in a particular case left to the child. It is very common in teaching.

Does leaving the child to make up her own rules lead to better learning? The button pressing experiment throws some light on this. The researchers tried giving some of the players, after a session or two, a description of how a button worked, for example, actually saying, 'The left button lights the light after a random number of presses.' Some students changed their strategy on hearing that but most did not change their strategy (no matter how inefficient) especially if it had been 'rewarded' on the guess-sheets.

So once again from research into learning, we have evidence that working things out for yourself is a very strong way of learning, certainly stronger than being told.

A further point: later in the experiment some students were told what to write down. This had less effect on what they did than rewarding their own attempts to say it their own way.

Findings so far

What is the most effective way of changing behaviour?

(a) Shaping what they **say** about their own behaviour appears to be the most effective way.
(b) Telling them what to do or say is less effective.
(c) Shaping their behaviour directly, is less effective, also.

As examples of these three findings : How do you get Jenny to take an umbrella?

(a) Getting Jenny to **say**, 'I think I will take an umbrella,' is most likely to result in Jenny taking one.
(b) Saying to Jenny 'Take an umbrella, Jenny,' is less likely to get what you want.
(c) Letting Jenny go out without an umbrella, and get wet, is even less likely to make her take one another time!

The school teacher will need to organise the situation so that Jenny thinks of it herself, possibly with one of those contingency questions such as 'What do you think about the weather? Will it stay fine?'

The order of learning seems to be that once our actions (non-verbal behaviour) have become determined by talk and rules (verbal behaviour) the surrounding contingencies seem to have little effect: it doesn't matter what the buttons are actually doing, that it looks like rain, that the astronaut is slowly coming down onto the moon's surface after a jump, that the teacher always marks 2 + 3 x 4 = 20 wrong. Once we have the rules we have made up for ourselves we stick to them; that is, until we are led to change our verbal behaviour, i.e., we form, in words, a new rule.

The lesson for teaching is: try to get the child to explain the rule that has led to the mistake, and then **put into words** a new rule which will avoid the mistake. In the arithmetical example, there are three steps:

(a) ask the child what rule got her the answer 20 (probably it will be something like, 'Read from the left');
(b) then set up an experience in which the child discovers the correct rule ('Can you get the answer 14? How did you do it? Here's another one: 4+3x3=13. Can you work out a rule about what to do first?);
(c) then get the child to put into **words** the new rule ('Multiply before adding').

Upside-down

The buttons and lights experiment reminds us that it is the learner who has to do the learning, even when the learning is about distant consequences. You learn better when you put it into your own words, when the attempt to do so is rewarded, and when you are not told the answer. What is strange is to see this confirmed when the learning is wrong, incorrect answers are rewarded, and the students learn falsehoods. It reminds teachers what they already know, that incorrect concepts can be strongly embedded (like that one about there being no gravity on the moon); and that lies are learnt the same way as truth.

Comment

We are social animals, and there are great advantages in being able to tell each other what to do. We watch and listen to other humans more than we attend to inanimate things around us, because this works best. But sometimes it would be better if we took more notice of consequences than of what was said.

What is said to us, as we have seen in the experiment, can be a distraction from the facts. What is said may come in many forms: it may come as a statement of fact, or a question, or as a definition, or as an instruction or command or rule. (It may also come as a comment or an instruction on language, rather than on the things the language is about.)

Rule-governed behaviour may well be encouraged by humans precisely because it is insensitive to what is happening. For example, the 5-year-old is having a great life without being able to count, so we can't say, 'check this change or you will starve today.' This is an example of needing to encourage the learning of rules when natural consequences are weak (when we tell children to study), or when consequences are remote (as when we tell drivers to wear seatbelts), or when the consequences are likely to encourage behaviour of which we disapprove (as when we warn against using drugs). Rule-governed behaviour is very important – after all, it is not necessary to *tell* people to do what they would do anyway! The list of things we do without being told is quite small – drinking when thirsty, eating when hungry, breathing, keeping clear of fire after being burnt.... The necessity of attending to words and rules is overwhelming.

More practical consequences

One of the reasons why we humans rely on rule-governed behaviour so heavily may well be that a useful rule can be enforced with an almost unrelated consequence. For example, 'Put your boots on before you go out to play in the snow,' is to stop the child getting cold feet, even, maybe, frostbite. But it can be enforced with social consequences, 'Because I say so, Mother knows best,' (or even physical punishment.)

An experiment that throws some light on how we learn from rewards is one in which a puppet was used to demonstrate some action the researchers wanted the children to do. The puppet moved a lever, stamped its foot and shook its head. The children were rewarded for imitating moving a lever and stamping, but not for shaking their heads. But the children continued to imitate the head shaking too. This carry-over effect of a reward (reinforcing things we did not intend) is well known to teachers, and may be part of the insensitivity we show to contingencies and consequences compared with verbally introduced rules.

Indeed it is hard to find examples, apart from motor skills, where adult behaviour is unequivocally contingency shaped. As described earlier, by the age of 5 most children are almost exclusively rule governed. However, we can change our rules when convinced of the need. In the same experiments Bentall, Lowe and Beasty found that, as with adults, the 5-year-olds' insensitivity to actual consequences could be overcome. It involved shaping (changing) their *verbal* behaviour, what they *said*.

Most human actions flow from verbal behaviour but clearly there are some points where consequences make direct contact. Many skilled motor actions probably do not allow changes to come about via words, for example, athletic performance or tying shoelaces. Some things we learn, especially those that require a lot of instruction when we begin, such as driving a car, finally become 'automatic' and the verbal part seems to drop out. But abrupt changes sometime trigger the verbal bit and it reappears. If you stall at lights on a hill, you may notice yourself repeating the words of your driving instructor, 'Don't worry about the cars behind. Handbrake on. Out of Gear. Turn the key...'

How to Change Behaviour

The Buttons and Lights experiment, and others mentioned in the references at the end, have shown that if you want to modify human non-verbal behaviour, (from doing arithmetic to pulling pigtails) you are most likely to be successful if you work on and change (i.e., shape) the relevant verbal behaviour. Our earlier example of Jenny and the umbrella, brings the distinctions out: getting Jenny to take an umbrella was most successful when we got her to talk about taking an umbrella.

At this point we are confronted with the question: what is the best way to shape verbal behaviour, that is, to get people (particularly our pupils) to modify their verbal formulation of rules? In fact we do not have much of a vocabulary that deals with altering words and formulations. At this level (shaping the words, not the actions) it is usually necessary to show the consequences of using the present rule, not just to alter its form of words – we all know the child who writes 100 times 'I must not pull pigtails' but carries on doing it just the same. Jenny has a rule, 'If it is sunny I don't need an umbrella,' This will not be altered if we tell her to change her rule to: 'If it is sunny I **do** need an umbrella.' But a glance at the weather report will do the trick if a cold front is coming this afternoon. Her rule stays the same, but is overridden by a new rule, 'I do need an umbrella **this** afternoon.'

Better still would be a new rule, 'I need an umbrella, no matter how fine it is, if I am going to be out for a while and rain is likely.' Refining rules and theories in the light of new discoveries is the way science progresses. So does learning.

Teachers have to give a lot of rules but the ones that are learnt best are those where the teacher has been able to engineer the classroom and the children's experiences so that the children discover, from the consequences, the correct new rule for themselves, and put it in their own **words**.

Given the central role played by verbal behaviour in contemporary social, political, economic and environmental settings, this subject could hardly have higher priority. We need to learn as much as we can about rule-governed behaviour.

Notes

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The paper on which this **set** item draws is

Catania, A.C., Matthews, B.A. and Shimoff, E.H. (1990) Properties of Rule-governed Behaviour and their Implications, in *Behaviour Analysis in Theory and Practice*, edited by D.E.Blackman and H.Lejeune. London: Lawrence Erlbaum, pp. 215-230.

A useful text on Behaviour Analysis and learning theory is

Catania, A.C. (1992) *Learning*, Inglewood Cliffs: Prentice-Hall. (3rd Edition).

That adult behaviour is rule governed, and therefore only indirectly governed by its consequences, is discussed in

Skinner, B.F. (1969) An operant analysis of problem solving. In B.F. Skinner, *Contingencies of reinforcement*, pp. 133-157. New York: Appleton-Century-Crofts.

The study of children's performance is

Bentall, R.P., Lowe, C.F. and Beasty, A. (1985) The role of verbal behavior in human learning: II. Developmental differences. *Journal of the Experimental Analysis of Behavior*, Vol. 43, pp. 165-181.

The Button and Lights experiment is written up in

Catania, A.C., Matthews, B.A. and Shimoff, E. (1982) Instructed versus shaped human verbal behavior: Interactions with nonverbal responding, *Journal of the Experimental Analysis of Behavior*, Vol. 38, pp. 233-248.

and

Matthews, B.A., Catania, A.C. and Shimoff, E. (1985) Effects of uninstructed verbal behavior on nonverbal responding: Contingency descriptions versus performance descriptions. *Journal of the Experimental Analysis of Behavior*, Vol. 43, pp. 155-164.

and

Shimoff, E., Matthews, B.A. and Catania, A.C. (1986) Human operant performance: Sensitivity and pseudosensitivity to contingencies. *Journal of the Experimental Analysis of Behavior*, Vol. 46, pp. 149-157.

The experiments by Stanley Milgrim showing that people will follow orders even when they involved torturing others are very well known and described in many psychology texts. A useful source is

Milgram, S. (1963) Behavioral Study of Obedience. *Journal of Abnormal and Social Psychology*, No. 67, pp 371-378.

Additional comment

Saying and doing

We sometimes say one thing and do another – such as not keeping a promise. Or we do one thing and say another – such as telling a lie. This reflects the way words, and language in general, is symbolic. In the real world of things and actions you can't have it both ways – each action is separate. For example, you see the red light and step on the brake; but stepping on the brake will not change the traffic light from green to red. With words and things mixed you can have it both ways – the word 'umbrella' produces (in the right circumstances, such as in the right kind of shop) the thing that opens up into a portable roof; producing the folding portable roof makes us say or think the word 'umbrella'. Symbols don't act like actions.

Another great thing about rule-governed behaviour is that we usually do not need a prompt. Just as we learn to avoid fire, once burnt, we can also do things without being told a second, and third, and fourth... time. For example we can use the rules of arithmetic at home and at the shops as well as in the classroom where the teacher is standing by to repeat them.

Is this facility more than just being able to tell ourselves the rules that were once told to us? We listened to someone else, (Policeman: 'Don't drink and drive!'); now we can speak the same message to ourselves, (Me: 'Don't drink and drive!') at the same time listening to what we say, (I said, 'Don't drink and drive!'). Put that way it sounds weird. It is one thing to respond to what someone else has said; it is another to respond to one's own repetition of what they said. It may be that rule-governed behaviour that depends on our own talk to ourselves is even more likely to be insulated from its consequences than rule-governed behaviour that depends on the utterances of others.

Implications for clinical work

We have shown, through the experiments, that working on, and changing, what people say, is often the best way to get them to change what they were doing. It is better to talk through those wrong answers than simply to put a cross (x) in the margin – the x is a non-verbal consequence.

This technique can be used with 'bad' behaviour too. When dealing with a mental disorder the therapist tries to get the patient to talk about it all. However, if you get new appropriate social behaviour through new verbal rule-governed means, the new behaviour may be insensitive to the consequences. For example, the shy child who becomes more assertive by following rules – 'don't let them push you around, answer firmly, look them straight in the eye...' – may not recognise the occasions, such as in the Principal's study, when such behaviour is inappropriate, missing the non-verbal signals that it is inappropriate.

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item 6

set research information for teachers
number two 1992

The Co-operative Reading Resource and How It Changed the Reading Skill of 8- and 9-Year-Olds

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University of Canterbury

Nicola Belsham

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The Resource

THE CO-OPERATIVE READING RESOURCE (which was evaluated in this study) is 140 reading books and 28 reading activity books grouped into 'stairs'. Each stair consists of 10 reading books on a common theme, a school reading activity book and a home reading activity book; one stair provides a reading programme for two weeks.

Each reading book contains multi-level text: it is designed so that part of the story can be read by the low progress reader, and part of the story can be read by a reading partner (a peer with well-developed reading skills). There is a gradual progression in both the difficulty level and the amount of reading required of both the reader and the reading partner as they progress through the stairs.

The 1st, 6th and 10th books in each stair also contain text which is to be read by the teacher. They have all been written, or adapted from traditional stories, by Terry Martin.

Here is a page from Stair 7, Day 7. The low-progress reader reads the bold text and the reading partner reads the ordinary type.

When I started school there were sixteen pupils. That's all. There was one teacher. His name was Mr Sims.

I cried a lot on the first day, but we won't go into that. Let's just say that some people find it harder to leave home for school than others. Mum and I arrived at ten to nine.

"Come in," Mr Sims said to Mum.

"This is Carole," said Mum. I went red.

"Pleased to meet you, Carole."

"I'm not coming," I shouted. "I'm going home."

"Oh," said Mr Sims.

"I will come back after," said Mum. She went to the door to go home.

I won't go into what happened after that except to say that there was a lot of screaming (from me), a lot of tears (from me), a lot of hanging on to Mum's dress (me again), and a lot of *comforting* talk (from Mr Sims).

Finally, I stayed. Mum left.

The other children were outside playing.

I am going home!

Rationale

Eight- to 9-year-old pupils who are still reading at a 5.5- to 7-year-old reading level have a number of special needs. They cannot yet decode unknown words with any consistency and they cannot monitor their own reading. They still require individual reading tuition. Several years of failure may also be damaging their self-concept and turning the reading task into something to be avoided.

Teachers are often unsure how to organise extra help for these children, and may not have the time to go searching for suitable texts. The school may not have the resources to provide an extra remedial teacher to give the individualised reading tuition which the low progress reader still requires.

To catch up, the slow reader needs a programme which will *accelerate* reading progress. To do this, the programme must provide a large amount of text at a suitable level so that the remedial pupil is able to do lots of reading on a regular basis. The programme must contain enough reading to take the reader through to the fluency building phase of reading development. Secondly, this reading must be interesting. If it is boring the child will be 'turned off' instead of being 'turned on' to reading. Thirdly, the poor reader must be provided with sufficient *support* to motivate continued reading and sufficient *tuition* to develop improved reading skill.

The Co-operative Reading Resource attempts to meet these needs. The stories in the booklets are often further chapters in an ongoing story-line which begins on Day 1 and ends on Day 10. The Resource is designed to be used daily and each stair contains reading and activities for a fortnight. The reader and reading partner share the same book; the stories have been made as interesting as possible; all are illustrated and include a liberal use of humour; there are factual and serious story lines; and every third stair is a middle school social studies or science topic.

The stairs are graded, the key being the text which is to be read by the low progress reader. There is a very tightly controlled vocabulary and the stairs produce a very gradual progression in text difficulty. The reading partner's text also becomes more difficult as the story lines grow in complexity. In addition, there is a gradually increasing amount of text for both readers. In the earlier stairs, the low progress reader reads about 150 words per story. Gradually the number of words per day increases, by Stair 9, to 300, then 350, then 450. The better reader provides a model, carries the story, moves the plot and stimulates interest, especially in the lower stairs.

The teaching cycle

During each stair, the pupils and the teacher engage in the following cycle. On Day 1 the teacher introduces the stair by reading the first of the ten stories to the reader (that is, the pupil with reading difficulties) and the reading partner (that is, the same-age peer who is a good reader).

On Days 2 to 5 the reader and the reading partner work together to read the next four stories and to complete the activities for those days. On Day 6 part of the story is set in sans serif type for the teacher to read. On Days 7 to 9 the reader and the reading partner work together through the next three stories and complete the activities for those days. On Day 10 the story once again includes text for teacher, reader and reading partner. The following pages from Stair 15, Day 10, illustrate the layout of Day 6 and Day 10 books.

How do we know these things?

Scientists have studied the moon and astronauts have been there.

The Chippewa Indians would never have thought that one day men would fly to the moon and walk on it. Yet their story does have a voyage to the moon in it. But there was no return journey.

We know that our Solar System has nine planets in it.

We know that the planet we live on is Earth and that all the planets go round the sun.

We say that they orbit the sun and the planets keep their orbits through the "pull" of the sun. This pull is called gravity.

We know that the planets which are closer to the sun take less time to go round it than the ones which are further away. One orbit round the sun is a year.

The planets also spin as they orbit.

This gives us night and day.

Think about the story of Maui and his brothers catching the sun and making it go slowly.

Is this a good explanation of the length of night and day?

Put yourself in the position of the early Maori people. Then think about your answer. Could there have been a better explanation?

The moon has an orbit around the earth and we know that some planets have more than one moon.

Two reading activity booklets, a set of daily classroom activities and a set of daily homework activities, accompany each stair. The classroom activities are varied, however, the reader is asked with some regularity to complete cloze tasks involving basic sight words. Time line and prediction activities are included – with the instruction that the two pupils should write 'a few lines each'. Sometimes, a theme is followed throughout the ten days. The social studies and science topics include charts which are to be completed co-operatively. Because a competent peer is assisting, the classroom activities book includes tasks which would have been beyond the reach of the reader alone.

The 12th booklet in each stair contains Home Activities for the low progress reader. These are deliberately kept short and simple. A summary of the story-line is provided. The homework activities are provided so that parents who are keen to assist are able to do so.

The Research

The aim of the research was to evaluate the effectiveness of the Co-operative Reading Resource in accelerating the reading development of 8- and 9-year-old pupils who were two or more years behind in reading. The experimental children were selected with care using recommendations by teachers, several different tests, and help from District Reading Advisors. The 40 children who were selected were attending 29 schools, ranged in age from 8.0 to 9.2 years and had reading ages from 5.5 to 7.0 years.

The children were assigned on a stratified random basis to one of two groups: Group 1 (an immediate start group) and Group 2 (a waiting list control group). Group 1 pupils started work on the Co-operative Reading Resource following the 1990 mid-term break (July 16). They worked on the Resource for 16 weeks during the second half of 1990 and for a further 16 weeks during the first half of 1991. The Group 2 pupils started on the Resource on February 18, 1991 and continued on it for 16 weeks.

Progress was assessed three times (in June 1990, November 1990, and June 1991). The researcher visited each child at school and, over a period of 30 to 40 minutes, administered the following tests.

Burt Word Reading Test (1981). This was used at each assessment. Testing took about 5 minutes per pupil.

Departmental Prose Inventory. This inventory was developed by the Wellington Reading Advisers and has been used extensively for a number of years. It consists of two reading passages at each half-year level from 5.0 years to 8.5 years and then two reading passages at each one-year level from 9 years to 16 years. The quality of the child's reading of the Inventory passages was recorded using the standard running record procedure (see Marie Clay's

Table 1

Days on Resource	Prose Inventory		LARIC		Burt	
	No. of children	Mean gain in months	No. of children	Mean gain in months	No. of children	Mean gain in months
14-30	2	9.0	2	18.0	2	5.0
31-50	9	16.0	7	14.5	9	3.4
51-70	10	16.2	9	16.6	10	4.5
71-90	7	28.2	6	27.0	7	9.7
91-110	8	29.2	6	41.0	8	9.5
111-124	4	28.5	4	33.0	4	9.2

Reading: the Patterning of a Complex Behaviour). In addition, the child was asked five comprehension questions about each passage and the responses to these were recorded. It took between 20 and 30 minutes per child.

Independent testing on LARIC passages. A second assessment of the reading level of each child was undertaken independently, usually by a Resource Teacher of Reading, using passages of known difficulty from the LAter Reading In-Service (LARIC) materials. A passage was coded as 'passed' if it was read with 95% accuracy or better. Running records were kept.

Teacher induction

During the June testing of each child, the researcher discussed the study with school principals and explained the operation of the Co-operative Reading Resource. The response was enthusiastic. Teacher induction began for Group 1 in June and for Group 2 the following February. First, the school was notified and a time was suggested for the researcher to meet with the classroom teacher. All the teachers agreed to take part. Secondly, the researcher visited teachers (who had been freed from their classrooms) to explain the operation of the Resource, the selection of suitable reading partners, and the tasks which were being requested of the teacher. Each teacher was given a Teachers' Guide which reiterated the points made by the researcher at this meeting with them. Teachers were asked to select one of their best readers as a reading partner rather than a friend of the low progress reader. Further guidance was offered in the Teachers' Guide. It was suggested that more than one pupil be trained as a reading partner to cover absences and to allow for change. Teachers were left to decide when to change the reading partner.

The researcher's policy with respect to teachers, throughout the study, was that they should be free to decide how they would use, and how often they would use, the Resource. This policy was adopted so that the evaluation was conducted under circumstances which were as closely similar to normal classroom conditions as possible.

Training of the peer tutor

A guide was prepared for the reading partners, welcoming them to the Resource and outlining their role. This guide described a simple tutoring procedure which the tutor was to follow. This was a variation of the 'Pause, Prompt, Praise' procedure (see Glynn et al., *Remedial Reading at Home: Helping You Help Your Child*). The teachers were asked to ensure that the peer tutor followed the guide.

School visits

Each child was visited at school at a prearranged time every two weeks. These visits served several purposes. They were used to deliver new reading books, they were used so that the reader's progress could be observed, and they were used to maintain contact with the class teacher.

Results

Teachers varied in their success in providing the daily reading programme which we had asked for. During the first 16 weeks one teacher used the Resource on only 14 days out of the 80 days available. Another used the Resource on 72 out of the 80 days. Thirty-two of the teachers used the Resource for half the time or more and the average was 64 percent.

The data in Table 1 indicate that, in general, the greater the number of days spent on the Resource (the greater the number of books read), the greater the average gain. This relationship is apparent on all three measures of reading although the gains on the Burt are only about one-third the size of the gains made on the prose reading tests. It is also apparent from the data in Table 1 that most of the gains were made during the first 90 or so days on the Resource.

Because this analysis showed a strong and clear relationship between the number of books read and the amount of improvement in reading achieved by the target pupils, the overall effects of the programme were analysed for those pupils who had used the Resource on at least 50 percent of the days on which it was available. We discovered that the average reading gain for the pupils in Group 2 over the 6 month period June to November 1990 (while these pupils were still the control group) was about 7.5 months. Note that the 'control' group had not been left entirely alone: twelve of these children were spotted as slow readers and were given some form of individualized or small group remedial reading instruction.

During their first 16 weeks on the Co-operative Reading Resource, the Group 1 children gained about 16.5 months on average (16 months on the Departmental Prose Inventory and 17 months on the LARIC passages). The Group 2 children, during their 16 weeks on the Resource, made closely similar gains (16 months on the Prose Inventory and 17.5 months on the LARIC passages). So the gains, once started on the Resource, were, on average, twice that made before starting.

The pupils in Group 1 who worked on the Co-operative Reading Resource for 32 weeks made an average gain of 32 months (30 months on the Prose Inventory and 34 months on the LARIC passages). Two pupils made gains of 4 to 5 years, 13 pupils made gains of 2 to 3 years, and 5 pupils made gains of 1 to 1.5 years.

There were, of course, differences in the amount of progress made. One pupil made almost no progress and several pupils made rates of progress which were more than twice the average for the group. One pupil made no progress during the first 16 weeks but, following a change in reading partner began to make progress during the second 16 weeks. One pupil made no progress but was found to have worked on the Resource for only 14 days out of 80. Another pupil was behaviour disordered, experienced a change of school, and worked on the Resource for only 38 days. He showed little gain on the Departmental Prose Inventory and refused to be tested by the independent tester.

Discussion

Progress in reading

The Group 1 pupils used the Resource on 95 out of the 160 days on average. Of the pupils who spent 80 or more days on the Resource, 16 out of 17 made accelerated progress in reading. Thirteen of that group are now less than a year behind in reading. Five have caught up completely and are reading at a level comparable with their age mates. This is a most favourable outcome.

In addition to accelerating progress in reading, the Resource also generated a number of other benefits. Almost all the pupils enjoyed working on the Resource, and that changed their attitudes to reading. Many of them read the stories at home with their parents or grandparents; many of the activity books were painstakingly completed. The children became more able to select reading books for themselves and, at library time, many began to choose *reading* books instead of the *picture* books which they had been choosing.

Nearly all teachers reported that the children had improved not only in reading but also in confidence. One teacher reported that 'this has changed his whole life.' Her pupil had become more outgoing and confident and looked forward to reading. Several of the pairs of readers became friends and one attended her partner's birthday party.

Evaluation of the Resource

The evaluation was designed to measure the effects of the Resource as a complete package. It was not designed to evaluate the relative importance of the individual components. However, observations made during the evaluation suggest that certain features of the Resource may be more important than others.

The Resource provides the low progress reader with 150 to 200 words of oral reading each day on the early stairs. This rises to 400 to 450 words a day on later stairs. Improvement was strongly related to the number of daily reading books which were actually read – at least over the first 100 or so days on the Resource. Pupils who used the Resource for about 50 days gained about 15 months in reading on average while pupils who used the Resource for 100 days gained about 30 months on average. This two-and-a-half year gain in reading achievement was sufficient to enable many of the pupils in the study to catch up with their peers. The greater effects of greater numbers of days on the Resource indicates that the *amount* of reading which the Resource provides is an essential element of its effectiveness. It is also clear that, for pupils who are two years behind their age-mates, the full benefit of working on the Resource is not achieved until the remedial reader has worked on the Resource for about 100 working days (20 working weeks).

Apart from the first book in each stair (which is read by the teacher to set the scene), all of the reading books consist of multilevel text. The remedial reader and the peer tutor read from a single book, taking turns in a way which is somewhat like reading a play. This mode of reading practice has a number of benefits. If the tutor is a good reader, as most of the tutors in the present evaluation were, the tutor is continually providing a model of good reading. In addition, the story unfolds in a comprehensible way only if both readers read in a comprehensible way. The remedial reader's contribution to the story is vital. Thirdly, the fact that the text is multilevel makes it possible to develop interesting plots and story lines because words that are necessary but more difficult can be placed in the text which is being read by the good reader. Generally speaking, the story lines used in the Resource did function to stimulate the interest of the majority of the pupils in the sample. As each pupil moved on to the Resource, their reading tended to become more lively, the pupils often initiated discussions with the researcher (during his fortnightly visits) about books recently read or books to come, and the general attitude towards reading became more positive.

Almost all of the good readers who were selected by their teachers to function as reading partners did their job very well and very conscientiously. All the reading partners quickly learned the tutoring rules which they had been given and the majority applied them dutifully.

The structured format worked well in some classrooms – especially where the teacher set aside a certain amount of time each day for the reader and reading partner to work on the Resource. On some occasions teachers 'made up' for missing days by allowing the pupils to read two books the following day. In some cases, the reader and reading partner prompted the teacher to provide the next day's book to work on. On some occasions tutors 'stood in' for the teacher, reading both their own text and the teacher's text in a Day 6 or Day 10 book. However, the provision of a structured resource was not sufficient on its own to ensure that it was used every day.

The classroom activities and the home activities may have been somewhat less important than the actual reading. There were no pupil pairs who completed all of the classroom activities. Although no systematic data was collected, the pupil pairs appeared to complete somewhere between one-third and one-half of the activities available. Homework, on the other hand was much more frequently completed. About 60 percent of the remedial readers completed homework activities on a regular basis. Whereas variations in the amount of reading done had a clear effect on reading gains, variations in the numbers of activities completed did not appear to have any systematic effect on reading gains.

Effects on the reading partners

During the planning stages, it was assumed that the reading partners would change quite often. This led to the decision not to collect data on their progress. However, one school was concerned that the programme might be detrimental to their good readers. They decided to test five reading partners before and after their 16 weeks work on the Resource. The teacher who tested these reading partners used unseen material from School Journal stories on both testing occasions. The teacher reported that all five reading partners improved in their reading from the 10-12 year level to the 11-13 year level with a couple of reading partners making even greater gains. The data collected by this school suggest that working with the Resource has benefits for the reading partner as well as for the remedial reader.

Reactions of the teachers

Nearly all of the 51 teachers who were involved in the evaluation responded very positively to the Resource. Forty-three made a conscientious effort to ensure that the children in the evaluation worked on the Resource regularly, and all spoke highly of its benefits. One teacher, who organized a group of pupils to work on the resource, wrote

'It's wonderful. The first time I've had children with reading difficulties working and reading well. And progressing.'

Such was the interest in the Resource that 32 teachers requested, and were given permission, to place additional pupils on the Resource. This they accomplished by making additional photocopies of the reading and activity booklets. Twelve further teachers, who were not involved in the evaluation, also requested and were given permission to use the Resource with one or more of the pupils in their class. Although the precise number is not known, I estimate that, by the end of the evaluation, photocopies of the Resource were being used with 185 pairs of children in addition to the 40 children in the evaluation.

A formal evaluation questionnaire was developed and distributed to participating teachers. It was hoped that it would be completed and returned each fortnight (at the conclusion of each stair). But the return of these questionnaires was erratic. The main purpose of the questionnaire was to identify any books which were too difficult or too easy and to identify any stairs which involved too great a jump in difficulty. None were identified by any of the teachers and those teachers who did return questionnaires just wrote positive comments. There were no negative comments at all.

Conclusions

Not only was the Reading Resource enthusiastically received by teachers and quickly spread around, but its regular use resulted in accelerated reading progress by almost all of the low progress readers. These results suggest that the needs of a high proportion of low progress readers could be met simply by providing teachers with the reading materials which these pupils require and the individual encouragement of a peer.

Notes

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Full details of the research can be found in

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Ready to Read

in the South Pacific

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Introduction

FOR THE LAST 20 YEARS most children in the South Pacific region have been taught English through the South Pacific Commission English Programme (SPC English). The children are first introduced to oral English. There is imitation and repetition of structures, and then the oral patterns are presented in written form to be learnt in the same way. The programme was developed in the 1960s when the methods of teaching a foreign language were strongly behavioural; it was thought that exposure to correct forms and imitation of them in a step by step programme would lead to mastery. The programme was welcomed by educational authorities and teachers because it was systematic, it could be carried out with relative ease, and used with large numbers of children.

Now there is concern about its effectiveness. It is widely used in the South Pacific and Micronesia, and variations of it have been developed in Tonga and Western Samoa. The programmes are indeed easy to use, they appear to have illustrations which show appropriate local settings, and some children do manage to learn English with reasonable success after being taught by these programmes. But would other teaching methods be better?

A New Reading Project

The Institute of Education at the University of the South Pacific in Suva, Fiji, began, in 1980, a Primary Reading Project. This was because of concern frequently expressed over the number of children failing to learn to read at primary school and the number of students at higher levels who had difficulty reading their text books. The project is based on the humanistic and holistic approaches used in research carried out in Niue in 1978 by Peter De'Ath on better ways of learning English, on the Fiji Book Flood Research of 1980 and 1981 by Warwick Elley and Francis Mangubhai, and on the work of scholars such as Dorothy Butler, Marie Clay, Brian Cambourne, Margaret Meek and Margaret Mooney.

As Project Fellow, Barbara Moore visited countries in the region to work with education officers and teachers on ways of improving reading programmes and providing more and better reading material when resources are very limited. The priority was not teaching English, but first language programmes and the production of books by local authors and artists. A Reading Centre was established at the University and Sereima Lumelume joined the project. There have been setbacks, but a network of key literacy people in the region has been set up, and a South Pacific Literacy Education Course is now being developed.

The need for change

The Fiji Book Flood was a research project which tested the effects of providing classrooms with a 'flood' of picture storybooks for use informally with children at Class 4, 5 and 6 level (ages 9 to 12). It proved to provide an effective way of learning English, possibly more effective than SPC English. However, since then there have been no marked changes in the way English is taught. The Book Flood has had an influence – more books are now read to children and 'shared reading' procedures are introduced to students at some teacher training colleges, and occasionally used in schools. But these are not official changes.

Bringing about change is difficult and expensive and there is no simple alternative 'package' to SPC English. The New Zealand *Ready to Read* books have become familiar to many teachers in the region because they have been used as a model of how to produce books in other languages. These teachers have studied how these books embody the principles of development, emphasise story quality, carefully consider moral values, have cultural sensitivity, and have realised how such books help with learning to read.

It seemed timely, therefore to consider whether the *Ready to Read* books in English might become an alternative to SPC English, with the books used alongside books created especially for the children of the South Pacific. So, the **Ready to Read Trial** was planned to discover whether teachers would find it difficult to move from a formal method of teaching English to a more informal approach, and whether children would benefit from the approach and from the *Ready to Read* books which would be the basis of the program.

The Ready to Read Trial

A proposal was drawn up with the advice of Margaret Mooney, Francis Mangubhai, Ian Johnston and other colleagues. Funding was kindly provided through New Zealand aid. The governments of the region were informed. The project began in the second term of 1988 in Fiji and Kiribati; Tonga joined in 1989 and Vanuatu in 1990. Each country chose two schools to take part and nominated a Project Officer.

The programme was introduced through workshops in each of the countries. The teachers studied the way in which children learn to talk, the implications for literacy learning, and the implications for learning a second language. Rhymes and songs were emphasised and guidelines for using the *Ready to Read* books were developed. A selection of the books together with the enlarged books and poem cards (made during the workshops) were provided.

Visits were made to the classes each term to assist and observe how the children responded. The teachers told us of their uncertainty to begin with and then their delight at the way the children responded, their keener interest in English and their love of the books. It was not always easy as classes in some instances were large, between 40 and 50, the climate was harsh on the books, and it was hard for some teachers to stop instructing and drilling in a formal way.

Final evaluation

The final visits to the trial schools in Fiji and Kiribati in October and November of 1989 provided an opportunity to record the children's progress, to observe the lessons and to talk over progress with the teachers. Pretesting and post-testing had been impractical since the children had little or no English. However, measures of individual progress became necessary as there were differences both between and within the trial classes. However, we were mainly looking for ways of diagnosing difficulties, not summing up progress.

Evidence of each child's progress was gathered through a Running Record, by retelling, by using the Word List and the Letter Identification tests from *The Early Detection of Reading Difficulties*, by using a nursery rhyme and by collecting an example of writing. Discussions were held with the teachers, who also completed a questionnaire.

Results

The teachers in the trial worked with commitment and care for their children and they all reported that they had enjoyed teaching in the less formal ways required. However, there were differences between the classes. Here are two examples.

In one class, the tests showed a wide range of ability. For example a group of girls were reading at the early stages of 'Fluent Level' and writing two or three simple sentences; another group were at 'Emergent Level', could read only the first books, *I Can Read* and *Old Tuatara*, could recognise only one or two words and a few letters. The more successful could recite nursery rhymes, the less successful could recite the first lines, or a few words, or murmur along to the beat. Retelling a story proved to be too difficult for everyone.

The samples of writing were brief and simple in content and structure:

My cat play with a dog. My cat looked at the car.

The cat is jumping on the bed. The cat walk on the grass.

Some children could only copy a caption.

In another class 26 pupils were tested individually and 14 read at an early 'Fluent Level' (independent reading of *Number One* and *Greedy Cat*, or *Fasi Sings and Fasi's Fish*). They recognised most words on the list and most of the 54 letters. Others read at 'Early Level' (independent reading of *My Bike* and *Paul*), and had similar good scores for word and letter identification. They all retold stories and recited rhymes in a very satisfactory way.

Their writing samples were six or seven sentences long, such as:

This is my cat. I like my cat. Every day I play with my cat. My cat is brown. My cat likes milk. I went to the shop with my cat. My cat likes playing with me.

Sereima Lumelume has continued to promote the Ready to Read Programme and more schools and more class levels are taking it up. The work, particularly the children's writing is remarkable. It is hoped to find time to collect comparative data – running records and writing examples – from schools where SPC English continues. We had felt that the Book Flood had shown empirical evidence for the superiority of good books over rigid vocabulary and grammar courses. We have found that the resource of good books and the techniques of the Ready to Read scheme can be used at an earlier level than the Book Flood had attempted.

Discussion

The teachers

The Ready to Read Trial Project was carried out partly to discover whether teachers at Class 2 level could change their way of teaching English. They had been trained to use a formal method with a set programme of oral English exercises and books which taught through repetition and exercises. The Ready to Read Programme was completely different; books alone provided the stimulus for thought and language, reading and writing.

All six teachers were able to change their way of teaching. For several of them it was easy. They were eager to use attractive books and the age-old methods, rhymes and songs and stories that they remembered from their own childhood or had used with their own children. They had a warm and close relationship with their pupils and were patient and tolerant with little children. Because of this they accepted the guiding principles of the new programme and gave their children a lot of responsibility for their own learning.

The teachers who were more authoritarian in their approach had the hardest task. They appreciated the need for change and cared very much about the progress of their children. But they found it hard to allow the children freedom to learn. There were problems because of this, but changes took place, and they now have a better understanding of their children and the programme.

The teacher plays the most important part in the success or failure of a literacy program. Good books and guidelines are not enough; the teacher needs to understand, accept and follow the principles which inform the programme. The Ready to Read Trial teachers attended workshops where they studied and discussed the ways in which children learn, the implications for learning in school and the complexity of the reading process, in order to appreciate the reasons for a new programme. Follow-up visits, letters and notes, provided further support and the teachers learnt a great deal from observing the responses of their children.

Teacher development, therefore, is an essential component in the introduction and development of language and literacy programmes. The actual programme was satisfactory on the whole, as it was rich and varied. Better use could have been made of rhymes and songs as they are, as one of the trial teachers said, 'a key to the door of reading' rather than just warming up exercises. There was still some confusion over the differences between 'shared reading' and 'guided reading' but the English lesson was a time of enjoyable interaction with books. In shared reading the children listen to a story, join in the reading at times (much loved stories become well known), and then explore the ideas and the language, through, for example, discussion, drama, art, craft, and writing. Guided reading is more formal: the teacher works with a small group, or even just one child, using text carefully chosen at the level they have reached.

The role of memorisation caused some concern as one of the criticisms of SPC English is that children memorise the structures without understanding them. Some children memorised whole books during the Ready to Read Trial. It was felt that this memorisation was 'meaningful' because, when asked, the children could retell the story in their own language, with dramatisation, intonation and expression indicating that they had understood. However, encouraging the children to retell in their own way, in English, once they were confident enough, and accepting their halting efforts would be worth trying. In one school the children were able to do this well and in another there were good attempts.

The outstanding feature of the programme was the daily writing produced by the children in the most successful class. The teacher had begun encouraging the children to compose their own messages in the third term of 1988 and had been so pleased with the outcome that writing became a daily and a welcome feature of the 1989 program. The other teachers felt that writing was too difficult for their children, that they needed training and a great deal of direct help. In these classes writing was usually restricted to copying, to writing memorised sentences and to substituting words in a familiar pattern. Writing will be used more freely and frequently in future now that the benefits are realised.

The Books

The twenty *Read to Read* titles chosen for the Class 2 program were suitable as there was a variety of style, subject and level of difficulty. Books with a rhythmical, repetitive text were easier for second language learners but they needed the challenge presented by books such as *Paul, Fasi Sings and Fasi's Fish* which tell stories without rhyme and repetition.

Twenty titles are not really enough for the first year of English reading but economy is necessary. (SPC English has one book for Term 2 and one book for Term 3 with 29 pages in each.) In most trial schools additional books were acquired through donations and fund raising so the programme was enriched. *Brown Bear, Brown Bear, What do you see?* by Jim Martin Jnr., *The Very Hungry Caterpillar* by Eric Carle, and similar books which blend well with the *Ready to Read* titles were much enjoyed. **The children enjoyed and appreciated the best of children's literature in picture book form.**

Care of the books was a great problem and difficult to resolve when classrooms were broken into and when the climate, coral dust and animal and insect life took their toll.

The Children

The progress of the children towards understanding and using English was the main concern of the Ready to Read Trial. The books provided strong motivation and the programme provided opportunities for learning. Most of the children enjoyed and benefited from the programme. Their enjoyment was evident from the beginning – a teacher in Kiribati who was observing a lesson said for example that the books were 'bringing the children closer'.

Lessons were cheerful, active times and the children took part willingly in dramatising the stories and in the activities planned for them. They joined in rhymes, songs and refrains from shared reading, gradually understanding the stories and being able to retell them in their own language and sometimes even in English. They began to read for themselves and to write when this activity was encouraged. In the most successful class the children made the kind of progress you would find in a classroom where English was the first language. In other classes there was a range of progress by the end of the year and in some classes there were children for whom the programme had not worked.

The fact that these children were referred to as the 'slow ones' and grouped together was probably a factor in their lack of progress. Special notes were provided suggesting that these children were not necessarily 'slow' and that extra attention and sensitivity to their needs would make a difference. Sereima Lumelume worked with a 'slow group' for a week and found that they responded well to books when given the opportunity to enjoy them without anxiety and pressure.

The guidelines which are being developed to accompany the (Fiji) Institute of Education *Ready to Read Programme* will include notes on ways of ensuring that all children benefit from it.

Educational Issues

The trial was carried out at Class 2 level as this is when English becomes an important part of the school program in Fiji, Tonga and Kiribati. It may not necessarily be the best time to begin second language learning.

In the South Pacific this issue may never be resolved because parents expect their children to begin English at this stage. It is, however, closely related to another equally important issue: the nature and effectiveness of the *first* language program. Too often, it is taken for granted that children will find it easy to learn in their own language. Methods and reading materials often remain unchanged and unquestioned too long.

If children are enjoying their first language programme because it is meaningful and alive, and if they are making good progress because they have opportunities to listen to good stories, to read good stories, and to discuss and write their own ideas and messages, all will be well. It is the **quality** of the programme which matters, whether it is the first language programme, or a second language programme (such as *Ready to Read*).

Conclusion

The Ready to Read Trial has shown that a whole language programme based on the *Ready to Read* books could be suitable for children learning English as a second language in the South Pacific. Teachers, however, need to accept and follow the guiding principles of the programme. This way their children will benefit from the opportunities they are given to develop their understanding of and their ability to use English. This trial could lead to the development of a South Pacific English programme where the *Ready to Read* books would be used alongside books by South Pacific authors and artists, providing motivation and inspiration for young readers and writers.

Notes

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This account of their research has been adapted, with permission, from

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Teaching in a Multi-ethnic School

By David Corson
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Introduction : Confronting the Legacies of the Past

Recognising the rights of children from cultural minorities, is new. Giving them special, different, treatment in schools, is new. But these new policies, more humane and more equable though they are, do not mesh easily with traditional monolingual and monocultural education (which is a hang-over from the nineteenth century), nor with the training and philosophies of many teachers.

More open and tolerant treatment of minorities is becoming common, even in countries that once tried to offer the world a veneer of cultural and ideological unity. A demand by minorities for recognition of their rights was a major factor in the ending of totalitarian regimes in 1989-90. Elsewhere cultural diversity is gradually becoming a cause for celebration. Cultural differences can be actively promoted through national policies on languages and through multicultural policies; for example, they are promoted through the Canadian Multiculturalism Act, 1988.

This welcome change in social values presents problems of a new kind for the management of modern schools. Policy makers are increasingly asking schools themselves to make efforts to understand the realities of their own unique situations and to discover solutions to their own unique problems. The starting point is to understand the realities of the cultural community outside the school fence.

Discovering Contextual Realities : The School's Cultural Community

Because they have worked for many years with the children in a particular community, staff sometimes assume that they are experts on the local context. This may be a false assumption: the community reality may be very different from the commonsense impressions that teachers have formed. In Hermannsburg, South Australia, it was only after 100 years of 'failure' that the teachers found they were trying to teach, in one school, two Aboriginal tribes who never mixed.

Teachers who are not members of the local social network, who travel into the community each day and draw their conclusions about it from the filtered impressions that they receive from their students (and from the caricatured descriptions that often circulate in staffrooms) may be highly biased in their assessments of the school's socio-cultural context. Sometimes teachers are so affected by their own acute sense of failure with children from certain backgrounds, or by their apparent success with others, that they perceive the backgrounds that failing children come from with a prejudiced or ironic view; they see those backgrounds as a deficit environment that is lacking some ingredient necessary for the children to succeed in school.

A large part of the answer to a school's difficulties in providing for culturally different children might be found if careful research into the cultural background of the children could be undertaken, and the results absorbed. However, accurate surveying is a job for experts; it is expensive and time-consuming. Furthermore, there are many pitfalls in collecting large-scale data about culture and language in a multi-ethnic context. An alternative approach is possible – school-based researchers can do a great deal to create a knowledge base for policy and planning at school level. This small-scale approach to community research can go on alongside research into the realities of the school itself.

Discovering and Addressing the Realities of the Multi-ethnic School Itself

Teachers, as school policy makers, need to become familiar with some basic approaches to small-scale research. Professional development activities may be needed.

Teacher Attitudes and Professional Knowledge about the Languages and Cultures of the School

Like everyone else, teachers are prone to the influence of prejudiced attitudes and stereotypes. But because of the real power that teachers have over the lives of children, they are in a unique position to put their stereotypes to work, sometimes with harmful effect. Stereotypes can encourage us to make distinctions in rank, order and value which can be very inequitable where multi-ethnic groups are meeting and mingling.

The following four statements about stereotypes are useful:

- stereotyping stems from illusory correlations between people's group-membership and their psychological attributes and traits;
- stereotypes influence the way information is processed about the members of groups (i.e., more favourable information is remembered about in-groups and more unfavourable information is remembered about out-groups);
- stereotypes create expectancies about other people and those who hold stereotypes often search for information and for behaviour in others that will confirm those expectations;

- stereotypes constrain the patterns of communication in those who have them and promote communication which confirms the stereotypes held (i.e., they create self-fulfilling prophecies).

Achievement in schools may seem to depend very much on objective criteria. However, when teachers judge a pupil's cultural background against the yardstick of their own categories about what constitutes 'quality' in educational performance, that cultural background can become an inaccurate indicator of children's educational potential. The matter is made worse if there are other indicators that reinforce teacher prejudices, such as children's dislike of schoolwork, lack of parental interest in the school, or evidence of disadvantage in the children's dress or appearance. Expectations get adjusted accordingly.

It is known that the teacher's expectations of children's potential can influence academic success and children's true potential can be overlooked or reduced in effect. This view is especially supported by Rosenthal and Jacobson's 1968 study *Pygmalion in the Classroom*. Seven years later Verma and Bagley found there had been a considerable amount of research since the 'Pygmalion effect' was identified that indicated that the average teacher has different perceptions and expectations of poor and minority group children. These lead to different treatment and to depressed performances by such children.

Prejudices and stereotypes, then, affect life chances. Clearly it is a responsibility of the school to try to minimise the impact of those prejudices and stereotypes wherever they might distort just arrangements for education. One way of dealing with this common problem is to conduct frank and open discussions among staff in a professional development exercise designed to uncover stereotypes and to counter their influence.

As a method of fact-gathering about staff attitudes and current school procedures, here is a checklist of questions. This list could be extended to cover other issues of ethnicity as well. It was compiled by school inspectors and circulated in Inner London Education Authority schools:

1. Are all staff aware of the language and dialect repertoires of the pupils in the school?
2. Do staff recognise that pupils' ability to use language effectively has an important impact on their view of themselves, and therefore on their confidence as learners?
3. Do staff accept the validity of all pupils' spoken abilities, and use these as a basis for developing their skills in reading and writing?
4. Are staff knowledgeable about what is meant by 'dialect', and do they have a positive approach to dialects other than standard? How is this reflected in the way in which they assess pupils' written work?
5. Are staff knowledgeable about the mother tongues which their pupils speak, and do they see these as a potential or real strength in the school?
6. Does the school acknowledge and support pupils' bilingualism and promote an interest in their language among all pupils?
7. Is there a satisfactory system within the school for identifying pupils who need help with English as their second language, for providing this help and for monitoring progress?
8. Are the teaching resources for English as a second language sufficient to meet the needs of the pupils in the school, and are they organised so that pupils have access to them in a range of subject areas?
9. Do teachers make positive attempts to draw out the experience of pupils who as yet are not entirely confident in expressing themselves in English?
10. Has progress been made in responding to the issue of language diversity through the language policy and practice of the whole school?

A checklist modelled on this one could provide a set of discussion questions for use among staff before more detailed information about teacher attitudes is collected.

The Linguistic and Cultural Diversity of the Children

A wise starting point for inquiring into children's language diversity is to make sure that parents and children understand what the inquiry is all about: what sort of information is needed; why is it needed; who is going to have access to it; how long will the information be kept?

It is also important that those organising research in this area are familiar with fundamental theoretical issues: how is the kind of language that children use affected by different 'contexts of situation'? For example, what children can do with their language in the playground may be very different from their language use in the classroom. And how is children's language affected by serving different 'functions of language'? For example, some children may be able to use language more readily to describe than to explain.

Teachers need to know a lot about language and about research methods before they can gather reliable information about language use; again school-based in-service work may be needed to build this expertise. The questions below are preliminary ones aimed at providing the data on which initial planning in a multi-ethnic school can be based. This is a summary of a more complete questionnaire. A description of the basic research methods to use is available in Corson, D.J. (1990) *Language Policy Across the Curriculum*.

1. What do you know about the languages represented in your school?
2. How is the use of community languages promoted in your school?
3. What provisions are made for the formal learning of community languages?
4. Where there are formal language classes, how are they organised?
5. How does your school support community efforts at language maintenance?

Raising the school's awareness of pupils' cultural diversity and its implications for the school's operations is perhaps the central activity of professional development in multi-ethnic schools. The questions below, for school staff and policy makers to consider, again are only introductory ones. However, collated responses to these questions will give key background information about the realities of teaching in a multi-ethnic school:

1. What different cultures are represented within your school?
2. How is this diversity reflected in the character of the school?
3. How does the school give value to the special experiences that culturally different children can offer?
4. How do children and staff learn about important cultural practices of the cultures represented in the school?

5. What are the provisions for staff, children and community to work together?
6. What are the different perceptions of educational and social success in the cultures represented in your school?
7. How does your school presently respond to overt racist behaviour among staff and children (name calling, denigratory comments about other cultures, physical assaults, stereotyping, deliberate mispronunciation of names, etc.)?

Policy Making at School Level

Schools with difficult multiethnic decisions to make will find that designing a policy for handling each important inter-ethnic issue helps a great deal. This 'policy' approach may be essential especially where small numbers of many different minorities are present in a single school. Language policies across the curriculum are central to school administration, yet relatively few schools anywhere have seriously tackled the problem of introducing them. One reason for this is that until recently schools in many places did not consider themselves very autonomous institutions; they accepted direction and control in decision-making, in important curriculum areas, from outside bodies.

Another reason is that schools are only now beginning to recognise the close link between the organisational arrangements that they create and the quality of the curriculum that they provide. The way to bind administration and curriculum together may be for schools to operate through closely negotiated policies that address the unique needs of the school, its clients, and its social and cultural context.

A language policy sets out guidelines that provide a framework for action. A language policy across the curriculum is not a 'simple' policy however; it may be useful to think of it as a bundle of policies, each one addressing a substantive language-related issue for the school in its social and cultural context. Multi-ethnic issues in a school are both substantial and important.

We need policies in modern schools to set out our considered responses to issues that involve beliefs or values or philosophy. These will include providing assistance to a wide range of children with special curriculum needs; the allocation of scarce resources needed by teachers in developing their curriculum programme; the use of facilities; integrating the help of parents and the community into the school, and so on. The one policy that reaches across all of these areas (and many others) is a language policy that sees language as the central instrument in learning and as the most accessible teaching tool available to teachers in every subject.

A language policy across the curriculum can be extended to embrace all of the issues that I raise in this article, because it is really a 'policy for learning' in the school. It needs to cover many aspects of the organisation and management of the school, such as: staff development, the supervision of minority language teachers, school-based research, support and advisory services, the role of parents, participation of minority groups in school governance, the avoidance of racial discrimination, bilingualism and first language maintenance, and second language teaching. It needs to cover many aspects of teacher approaches to language use, such as: cultural awareness, providing for 'special case' ethnically different children, attitudes to language use, and gender, language and the curriculum. Of course it also needs to cover the full curriculum itself, addressing such areas as: oral language use, reading in every subject, watching and moving, language awareness, and assessing language and learning proficiency. A multiethnic school with a commonly agreed, regularly revised and operating document of this kind, might be a long way down the road to true effectiveness.

Parents

Modern schools, seeking to reduce the social distance between themselves and the cultural communities from which their students are drawn, are trying to extend participation in policy making to parents (and others as well). Although in modern democracies parents and community members are increasingly better placed to influence a school's programme, there is often very strong reluctance on the part of parents to participate very much in school governance. It takes persistence on the school's part to overcome this.

At the same time it will take strength of purpose not to cater simply for the needs and interests of the politically active in preference to the apathetic, of the rich in preference to the poor, or of the culturally similar in preference to the culturally different. The implementation of a language policy, for example, will need to be explained carefully to parents and to those critics of a school who tend to demand product rather than process from its curriculum.

This will pose a serious difficulty in those communities where parents perceive schools as existing expressly to reproduce a particular cultural bias or to maintain a social status quo. In New Zealand, for example, there is the phenomenon of 'white flight' from some multi-ethnic schools where new policies of biculturalism have been introduced. This happens most often when administrators have failed to communicate and negotiate with the many parents whose backgrounds are narrowly monocultural. Parents have withdrawn their children from the schools and sent them elsewhere.

Wise policy-making will include ingenious but practical ways in which parents can be involved in the design of policies or at least ways that they can be kept informed about the stages in policy development. If this is to be more than tokenism, the goals and organisational reality of the school will need to be communicated over a long period to the community, beginning in small ways but extending deliberately and purposefully until regular two-way communication becomes commonplace and natural. A well thought-out policy may be needed for just this task alone, providing a bridge to other developments.

Meeting the Language Needs of Children in Multi-ethnic Schools

Children's language needs are unique and severe educational disadvantages for individual children can easily go unnoticed. In some places difficult and often intractable problems exist in planning bilingual education for those children whose mother tongue is a regional variety of a national language, as may be the case for Italian-Australian children of rural Sicilian background. How can bilingual studies proceed in Italian and English for these children if neither English nor Italian is the children's true mother tongue?

More common, in very mixed societies, are schools and classes that include too great a diversity of minority students to allow any form of genuine bilingual schooling to proceed. Second Language Teaching (SLT) is the best that can be reasonably provided. Each school has its own special problems which will need (a) research, (b) expert help, and (c) a school language policy.

Bilingual schooling is most common when a large group of children already have a different first language (or are being immersed in a second language for cultural or political reasons). SLT, on the other hand, provides for individual special cases in a classroom and for small groups of linguistically different children. For them additional individualised provisions may be needed to maintain their mother tongue, to introduce the majority language thoroughly, and to provide cultural studies activities as a bridge between the cultures of the two languages. Peer tutoring techniques, parent help and withdrawal teaching by culturally similar adults, these are important supplementary techniques.

Bilingual Schooling

There has been a radical change in attitude and approach to bilingualism in education as our information about the links between language, culture, self-identity, thinking prowess and educational success has grown. Maintaining the minority mother tongue develops a desirable form of cultural diversity in societies, promotes ethnic identity, leads to social adaptability, adds to the psychological security of the child, and develops linguistic awareness. What is the evidence, then, for extending bilingual schooling?

Evidence is appearing in many places. In the Netherlands, for example, a bilingual maintenance approach to the education of minority children is favoured because it is found to be just as effective in promoting majority language learning as other approaches and actually requires less time to be devoted to the teaching and learning of the majority tongue.

In the UK the MOTET project in Bradford assessed the effects of bilingual education in a one-year experimental programme with infant children whose home language was Panjabi. The class programme aimed to preserve a 'parity of esteem' between English and Panjabi by allotting equal time and space to each language in every subject. The study concluded that there were no negative effects from bilingual education. Instead there were positive effects from mother tongue maintenance, and a level of progress in English that was equivalent to a matched control group who had not received a bilingual programme.

Again in the Netherlands, programmes in Leyden and Enschede for the primary age children of Turkish and Moroccan immigrant workers suggest that minority language teaching for children from these backgrounds has no negative educational or social effects. In short these programmes achieve only good results.

Moorfield in 1987 reviewed programmes over the last twenty years in Mexico, the USA, Sweden and Canada where children began school speaking a minority language or dialect and where that language was used as the main or only medium of instruction. Later for all these children there was a gradual transition to instruction in both the minority and the majority language. Academic progress achieved in each case was much better than in those programmes where minority language children were taught entirely in the majority language. Student self-esteem, pride in their cultural background and group solidarity were also enhanced in each case.

In other settings, where the needs for bilingualism and bi-literacy are so obvious that the question of their desirability is never even raised, initial and advanced literacy in two languages becomes possible; 'real' bilingualism becomes a natural and necessary acquisition for all children. (References to these research results are given in the **Notes** section at the end.)

Cummins and Swain provide a guide to the research in bilingual education currently taking place in Canada. The authors contradict many of the prejudiced views that have been widely held about bilingualism and education. For example:

1. they offer strong evidence that quality bilingual programmes have been influential in developing language skills and in contributing to broader academic achievement;
2. they suggest that in some respects older learners have advantages over younger ones;
3. they report evidence that lower ability children also benefit from immersion programmes;
4. they conclude that a quality bilingual programme will support and aid development in the first language.

We must not overestimate the advantages of bilingualism for a child's everyday mental functioning. On the other hand there is good evidence to suggest that bilinguals are superior to monolinguals on divergent thinking tests; bilinguals have some advantage in their analytical orientation to language; bilinguals also show some increased social sensitivity in situations requiring verbal communication; and bilinguals may have advantages in cognitive clarity and in analytical functioning. What, then, are the organisational arrangements a multi-ethnic school needs to make to provide quality bilingual instruction?

School organisation for bilingual teaching

The study *Learning English through Bilingual Instruction*, carried out by Wong Fillmore in the USA, arrives at four major instructional factors:

1. high quality teaching, including clear lesson organisation, directions and explanations, appropriate aids, attention to higher level skills, and opportunities for oral activities;
2. high quality instructional language, including clarity, coherence, use of contexts, paraphrasing, responding to student feedback, and discussion of grammar and vocabulary;
3. effective classroom management with stress on academic rather than on non-academic activities;
4. provision of equal opportunities for the practice of English.

Effective classrooms in these studies displayed a balance of teacher-directed and individualised activities. In bilingual classrooms students profited most when the languages were presented separately, without translations. Notable differences appeared in the learning orientations of the Chinese and the Hispanic students. The Chinese learnt most in structured and fairly quiet classrooms; the Hispanic children gained most from interaction with their peers.

Also in the USA, a long-term comparison of three approaches to bilingual schooling for Hispanic children has been undertaken. The three approaches are:

1. immersion strategy, in which content subjects are taught through simplified English;
2. early-exit (short-term) transitional bilingual programmes of 2 to 3 years;
3. late-exit (long-term) transitional bilingual programmes of 5 to 6 years.

Comparisons found long-term bilingual programmes to be most effective in promoting progress in both Spanish and English. Immersion programmes promoted a greater use of English around the school grounds. Elsewhere in the USA, Spanish-dominant children attending schools in California benefited both academically and in their English language acquisition by having their mother tongue used as the language of instruction in the early junior school years.

It seems likely that there are threshold levels of language competence: bilingual children need to get to a certain level in their first language before learning another in order to avoid cognitive disadvantage. After that level there are beneficial aspects of becoming bilingual. Theoretical information of this kind is essential for language planning in bilingualism at the junior school level. (Two important books are mentioned in the Notes.)

Another interesting discovery by Cummins and Swain is that *less* instruction in the second language often results in better second language learning by minority students, while for majority language students *more* instruction in the second language results in better learning. For example, Cambodian refugee children learning English in Australia and New Zealand need little 2nd language (English) teaching – just ordinary school lessons carried out in Khmer and exposure to English (which is all round them). However, majority culture Australian and New Zealand children need a lot of instruction, given in French, to become proficient in French, very little in English to remain proficient in English.

Cummins and Swain also present research evidence suggesting that in some aspects of second language learning older learners are more efficient learners than young children. From their discussion three key points can be made about bilingualism and schooling:

1. a high level of proficiency in both languages is likely to be an intellectual advantage to children in all subjects across the curriculum, when compared with their monolingual classmates;
2. in social situations where there is likely to be serious erosion of the first (minority) language, there is a need for the development and maintenance of that language if intellectual performance is not to suffer;
3. high level second language proficiency depends on well-developed first language proficiency.

Putting these three points together we can conclude that children from linguistic minority groups generally profit from bilingual programmes in which their first language plays the major role, because this lays a language foundation which cannot otherwise be guaranteed. In contrast, children from dominant majority language groups benefit from bilingual programmes in which the second language is used most frequently.

The third point above, that learning a second language well depends on developing prior proficiency in the first language, is broadly consistent with the findings of educators in the former USSR and Germany whose research is not so readily available but very extensive.

Many minority children, both indigenous such as Aboriginal and Maori, and newly arrived immigrants such as refugees, can arrive in schools with their first language relatively under-developed in certain contexts, styles and functions of use. Their grasp of the majority language may be limited to a small range of functions as well, often passively related to television viewing and the like. For these children intensive early exposure to the majority language may result in low achievement in that language, as well as a decline in mother tongue proficiency. Bilingual programmes in the minority language are essential if widespread and discriminatory school failure and its attendant social costs are to be avoided.

A second important variable factor in bilingual programmes for minority children is age of acquisition of the second language. Very young children (under five), given the necessary environment, acquire a second language quickly and seem to pick up two languages simultaneously without much difficulty. Although most theorists agree that there is some advantage in a very early start in second language learning, the causes and the nature of that advantage are far from clear.

The situation becomes more complex for older children. Finnish children moving to Sweden and learning Swedish early in their school careers, lost much of their proficiency in Finnish; others who moved later (at ten years) maintained a level of Finnish very close to their age mates in Finland while also acquiring proficiency in Swedish. Different social influences might have influenced the younger children's academic performance, but the age-related results are significant. Support for this view comes from Canadian studies of immigrant Japanese children, and there is evidence from the Netherlands, and Indo-China too, that older children manage to maintain and develop cognitive and academic skills in their first language to a greater extent than younger immigrant children. Children between nine and twelve years also make more rapid progress in academic aspects of their second language than do children between five and eight years.

In summary, it seems very important that the child's first language (in this case, the minority language) be given maximum attention up to the stage of middle schooling so that skill in using it to manipulate abstractions develops and also so that it can be used to perform the cognitive operations necessary for acquiring the second language. This is not happening in many places, notably in most public school systems in the USA, in Australasia and in the UK. We can see that there is a strong argument for deferring formal bilingual programmes until quite late in schooling and concentrating instead on *minority mother tongue* development.

Other influences on children's performances in bilingual programmes are beginning to emerge. From the scanty evidence that is available we can, nevertheless, say that children from low-income backgrounds, children of average ability, and children of below average ability can all be successful in bilingual schooling. You do not have to have high IQ test marks, nor come from a wealthy family, to learn a second language well.

Motivation to learn or retain is another variable influencing learning a new language. Social pressures can pull adolescent students, in particular, towards using the dominant language and these pressures may frustrate attempts in school to use the minority language for instruction. Early adolescent Hispanic children in the USA in some cases prefer to use English even when they can converse far better in Spanish.

School Organisation for Second Language Teaching (SLT)

A multi-ethnic school with a well thought out language policy tries to meet its own unique set of language problems. Each of these sixteen approaches listed here has been used in a multi-ethnic school. In most, several methods operate alongside one another, each one addressing different language problems and providing for the unique needs of those minority children whose numbers may not be large enough to permit viable bilingual teaching.

1. reception units
2. integrated and co-operative teaching
3. paired teaching
4. parallel teaching and programming
5. withdrawal teaching
6. SL extension
7. correspondence school enrolment
8. peer support systems
9. enrolment in SL evening classes
10. curriculum planning for first language support
11. curriculum planning for the development of study skills
12. familiarisation programmes
13. language support across the curriculum
14. incidental teaching
15. rotation teaching
16. special purpose teaching

Sometimes other patterns of organisation and planning are necessary. Think how different Aboriginal culture is from that of an Italian, Dutch or Greek immigrant. Following the wishes of special groups, the school may need to make several different arrangements, each reflecting cultural preferences. For example, despite their cultural differences, some Pacific Island immigrants in New Zealand and some Panjabi-speaking groups in the UK prefer their children 'mainstreamed' – integrated into ordinary classes. These people prefer to take the responsibility themselves, outside the school, for passing on their own culture and they want nothing more from the school than that it give their children full access to the dominant culture and the majority language.

Others ask that their children be kept together by themselves at least for some of the time, so that the culture can be preserved. Among the Inuit native people of Canada highly dispersed small groups are taught in bursts by itinerant teachers; this is considered a good idea, it is common, and quite practical. Elsewhere, the pupil's preferences in grouping are listened to, especially those of older children. Some balance, then, needs to be maintained between school, pupil and parent preferences in these matters.

At least three other SL issues need to be addressed in a school policy where there are many different cultures: (1) how is the school to approach the cultural features of minority groups; (2) what is the 'official' attitude of the school to the minority cultures; (3) what place can members of the minority culture have in school governance? In the next section I describe a school where great attention has been paid to the school community's multi-ethnic nature and where the school has been re-shaped accordingly.

The Reality of a Multi-ethnic School

It is possible to modify and build on the foundations of contemporary schooling to make the school more organic to its cultural community. In a few places school principals and their colleagues have begun to change things in a planned way, and with good effect. Courtney Cazden in 1989 made a case study of one contemporary inner-city school: Richmond Road School in Auckland, New Zealand.

At Richmond Road, over many years, a Maori school principal purposefully communicated a vision to his staff, based on his own professional expertise, his insights into cultural questions, and his understanding of 'how children thought, and how they saw the world'. Richmond Road School in 1989 had 269 students, of whom 21 percent were Samoan, 20 percent were European New Zealanders, 18 percent were Maori, 34 percent were other Polynesian, and 7 percent were Indian and others. Even after the Principal's death, the school has demonstrated its capacity to be a 'self-sustaining system' by taking on the task of reform and improvement that is necessary to keep a worthwhile system operating. How is Richmond Road different?

> In contrast to the isolation of teachers in single-cell classroom schools, Richmond Road teachers work in a setting of intense collectivity. Children and staff interact in complex organisational 'systems', as they are always referred to: vertical/family groupings of children; non-hierarchical relationships among the staff; curriculum materials that are created by teacher teams at the school and rotate around the school for use by all; and monitoring systems for continuous updating of information on children's progress.

For his vertical grouping system the Principal borrowed the example offered by non-graded country schools. It is often claimed that small rural schools offer a most desirable form of elementary education; former teachers and students alike have happy memories of these schools. At Richmond Road four *rōpū* (vertical groups) operate in shared or separate spaces, one of them including a Samoan bilingual group, another a Maori bilingual group, and a third the SL language unit for non-English speaking newcomers to New Zealand. Each *rōpū* includes children from the entire age range, from five-year-old new entrants to eleven-year-olds. Children stay in the same *rōpū* for their entire primary schooling, working with one home-group teacher in frequently changing vertical home groups of 16 to 20 pupils. Also attached to the school are immersion culture/language pre-schools: *Te Kōhanga Reo* and *A'oaga Fa'a Samoa* (Maori and Samoan 'language nests'). The school bilingual units receive the graduates from these pre-school language nests, provided parents agree. During half of each morning and every other afternoon, the teachers in these units speak only Maori or Samoan and the children are encouraged to do likewise.

Paired teaching and reciprocal instruction is common in this school. The authority possessed by the principal, based on his specialist culture and administrative knowledge, forms a model for authority among all the school community members: 'whoever has knowledge teaches'. As a result the official hierarchy of ascribed statuses has much less meaning. For example, although *Nga kaiarahi reo* (the language leaders/assistants) have no formal professional training, they function as full teachers in virtue of their undoubted expertise and on-the-job training. Again, the school's caretaker (janitor) is involved in the educational work of the school as a valued colleague, supporting children and staff, respected by parents, and a friend to all the children. Parents too contribute their special knowledge and 'the front door is always open'. The school is organic to its community.

In this system of organisation the obvious stress on communal activity for the students is extended in other directions too: the bonds of participation between people are promoted at various levels. The vertical grouping of the *rōpū* makes co-operative curriculum and resource development by teachers possible. Organised into five curriculum groups, that deliberately cut across the *rōpū* teaching teams, teachers collaborate in making 'focus resources' for school-wide topics that follow a multi-year plan, so that all minority groups are assured of exposure to each topic. Each team makes materials at ten reading levels for use in four learning modes: (1) 'teacher'/child; (2) co-operative; (3) collaborative; (4) independent. Each teacher is responsible for making a number of different items. When ready, materials are presented to colleagues during staff meetings and then they are rotated throughout the school, staying in each *rōpū* for fixed periods. Clearly, as well as collaboration, there is efficiency and effectiveness here. One staff member remarks, 'Think if you'd prepared that quality of work all by yourself for your class... It'd be impossible to do that, for the amount of quality you get back. You get a greater range of ideas too...' Like the school itself, curriculum materials are matched to the community the school serves and target the needs of the students.

Richmond Road is also a learning community for adults: they learn about teaching, about other cultures and about themselves. The principal encourages workshops and conferences, contact with up-to-date theory, worthwhile staff meetings and discussions; he encourages staff to share and explore their own and each other's cultural and class backgrounds (which are as diverse as the children's). By working together themselves, teachers learn about collaborative techniques for learning and this offers a sound model for the students. 'I think that's why the children work together here, because they can *see* us working together'. It is plain that the overtly competitive nature of regular schooling is missing from this environment. The self-esteem of the pupils, including their growing sense of pride, their sense of who they are, and their sense of involvement in a worthwhile community, is put ahead of their academic performance. Yet the environment for academic development does not seem to suffer as a result. Cazden sets Richmond Road against a recent US report on 'effective schools' and finds that that report's essential features are matched 'amazingly well' at Richmond Road:

1. shared values, especially about the purpose of the institution, what students should learn, and how teachers and students should behave;
2. a common agenda of activities that provide opportunities for interaction and link students, faculty and administration to the school's traditions;
3. and a distinctive pattern of social relationships that embody an ethos of caring.

Conclusion

Great advantages can come from well run multi-ethnic schools. Where the minority community has a major hand in policy making and in the schooling process, the entire programme of schooling is directed towards elevating the status of the community. Language questions become subsumed under much more important issues; language is often only an all-pervading (and sometimes distracting) factor. The minority members of that community become the experts: they are the advisers and real controllers of the education programme; their values shape the educational outcomes. Local political mobilisation with real purpose can begin to occur. Community attitudes are laid bare and discussed. Local people receive formal training as teachers. Parents participate in the activities of the school to a greater degree and they acquire skills that were previously not their own. All of these things, and many more, contribute to the elevation of local minority groups. Political consciousness awakens where perhaps previously there was none. And the language of the minorities becomes available as a recognised political voice at the same time as their political will begins to assert itself.

It is likely that multi-ethnic schools controlled and run by remote bureaucracies and staffed by teachers whose culture is not the culture of the local community get in the way of all this. When majority culture educators look at minority children they tend to focus on what those children lack. What they usually see is the absence of a high level proficiency in the majority language and knowledge of the majority culture. This lack becomes the focus of the schooling that they offer those children.

Educational reform policies of compensatory, multicultural and anti-racist education, imposed from afar, make little difference to educational inequality. Only a local community can really decide what is necessary. When communities themselves are in charge of education, when they themselves have the respect and the dignity that goes with deciding the future of their offspring, they themselves come to see education in a much broader way. They begin to ask each other about the best way to educate their children and about what might be wrong with the conventional processes of schooling with which they are familiar.

Notes

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Conclusion

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item 9

set research information for teachers
number two 1992

Teaching Our Students

Adapting teaching styles to cultural and class differences

Paul Wood
Melville High School

Preface: for white middle-class teachers only.

TEACHING CHILDREN who are not of our own culture or socio-economic background can be, at best, difficult and frustrating; at worst our teaching seems to perpetuate poverty and powerlessness. Here is a way of looking at the differences between ourselves and our pupils. The differences were discovered by researchers working in classrooms. The model they present may not seem totally fair to us, nor to the children, but it is stimulating and new. AND there is a extensive section called WHAT TO DO NOW.

Introduction

Two important research papers have been published recently that have implications for the way we teach our students.

At School I've Got A Chance, Alison Jones, Dunmore Press Limited, 1991.

Locus of Control and Ethnic Membership: A study of Secondary School Students, Sen Hi Wong, University of Waikato, 1990.

Both women worked in schools, one in a school in Auckland and the other in schools in Hamilton.

They found that people have very different expectations of what school can do for them; and these expectations are often tied to culture and class. I will attempt to summarise the major findings.

It can be said that people interpret the world from one or other of two extreme viewpoints, or they may fit somewhere between. The two extremes can be called *having an **internal** locus of control* or *having an **external** locus of control*.

By counting heads Sen Hi Wong found that the *internal* locus of control viewpoint is held most strongly by Asiatic immigrants and the 'top' socio-economic groups (SES 1 and 2). These people accept that there are things that happen that cannot be controlled (like earthquakes) but that these are infrequent events. To them it is a person's response to these events that really counts, even dictates the outcome. They hold strongly that the individual is in control of his or her destiny, that thought, effort and action determine consequences and future directions. 'I am the master of my fate...' is their view of life.

Again by counting heads, Sen Hi Wong found that the *external* locus of control viewpoint is held most strongly by Polynesians (in New Zealand, Pacific Island immigrants and Maori) and the 'lower' socio-economic groups (SES 4, 5 and 6). People in this group believe that fate, nature or god(s) control events and that the individual is a passive player within the cosmos; all the individual can do is make the best of it and accept that this is the way things are meant to be. Some would sum this up by saying, 'Thy will be done.' Others say, 'It was meant to be, ' or 'It's my destiny.'

Most teachers fall into socio-economic Groups 1 and 2. It is very difficult for them (impossible for some) to appreciate or accept that a lot of people believe that their own actions have little effect on the directions their life takes.

The following is a list of the characteristics, the beliefs and the life strategies of students of each type. It is a rough guide for sorting out attitudes to schooling, pointing up extremes – most people will have some characteristics from the opposite list, here and there.

INTERNAL	EXTERNAL
High desire for success.	Low desire for success.
Success depends on Ability Mood Effort.	Success depends on Task difficulty Luck Teacher bias Help from others (not usual).
That factors increasing success can be controlled.	That factors affecting success cannot be controlled.
Information seekers.	Wait to receive information.
Failure attributed to lack of effort.	Failure not attributed to lack of effort.
Feelings of competence and confidence come with success.	Feelings of gratitude accompany success.
Feelings of guilt and shame accompany failure; depression, apathy and resignation may accompany lack of ability.	Little deep emotional response to success or failure.
Success is controlled by self.	Success is determined by other factors.
High expectations of success. (High aspiration level)	Low expectations of success. (Low aspiration level)
Will attempt similar endeavours if success has been gained.	Success will not encourage further attempts at similar tasks.
Persistent behaviour, seeking mastery.	Learned helplessness, focusing on past failures.
High self esteem.	Low self esteem.
Remain at school.	School drop out.
More persistent in problem solving.	Give up easily.

Higher academic achievement.	Low achiever.
Better 'reasoning' abilities.	Poor 'reasoning'.
Better information processing.	Poor information processing.
Believe in self control of fate.	Believe controlled by fate.
Work hard.	Minimum work.
See advantages in planning ahead.	Little reason for planning.
Have friends who respect achievement of high grades.	Rubbish and ridicule academic achievement.
Parents think positively about further education.	Parents see a job as the main goal.
Mother has strong internal locus of control.	Mother has external locus of control.
Greater motivation and confidence, forget failure easily.	Lesser motivation, lack confidence, anxious.
Attempt remedial action in the face of failure.	Accept failure.
Use feedback information.	Regard feedback information as irrelevant.
Intrinsic reinforcement modifies behaviour.	Extrinsic reinforcement modifies behaviour.
Do well in 'open' classrooms, (low disciplined conditions) and traditional classrooms (high disciplined conditions).	Do well only in traditional-classrooms (high disciplined conditions).
Do better in contract-instructional conditions.	Contracts have little effect on success.
Benefit from correcting their own mistakes.	Benefit more from teachers correcting mistakes.
Benefit from low structured environment.	Benefit from high structured environment.

Do you find it hard to believe that a child could actually believe, sincerely, the following rules?

(1) do not revise for a test because it will make no difference;
(2) do not go over the test afterwards – it will make no difference;
(3) do not plan because your own plans are of no use.

But when students with an *external* locus of control say, 'I failed because it was too hard' they really mean just that. They sincerely believe that even if they had revised, listened in lessons and read books about the topic, it would still have been too hard. When they say, 'I was lucky to pass', they mean and believe that their pass was due to luck; when they say 'I failed because the teacher didn't like me' or 'they passed because the teacher likes them', it is a true fact for *them*.

We teachers often interpret the behaviour of such children as lazy, uninterested and unmotivated, and we think their parents unsupportive. But we have an *internal* locus of control and we *'know'* that you can succeed by working, revising and planning. It is hard to understand that there are people who do not believe in our 'protestant work ethic'; that there are people who see the world quite differently. To us it is 'untrue' that the teacher has failed to teach, to them it is patently obvious.

Understanding

The first step in increasing the success of these students of ours is to recognise that their framework of thought is different from ours, but it is as true for them as ours is for us.

Alison Jones documents the way children behave in class. The European students of socio-economic classes 1 and 2 interact with their teachers in a distinctive way. No matter whether they are in mixed-ability classes or streamed classes they enter into a dialogue with the teacher and together they direct and construct their learning. Discussions occur and knowledge is explained and explored. Project work and self directed work are equally a part of lessons as note-taking. In mixed-ability classes these students (*internal* locus of control) are the ones that ask questions, answer questions and become involved in the lessons.

In mixed-ability classes the children of socio-economic status (SES) 4, 5 and 6 and those with an *external* locus of control (including in New Zealand Maori and Pacific Island students) are the ones who sit at the back talking about the weekend, writing notes to their friends, or doing other things, waiting for the teacher to write the work to learn on the board. As soon as the teacher writes it on the board they stop being disruptive and sit copying.

In 'low' streamed classes these students are in the majority. They generally do not interact with the teacher in structuring knowledge. They wait to be told what to do, what to write, or what to copy. They expect the teacher to teach them, they believe that they are 'empty vessels' to be passively 'filled' with knowledge by 'the fountain of knowledge' – the teacher. They expect that they will pass (or fail) the test or exam as a result of their teacher's hard work and ability to fill them with the appropriate knowledge.

Classroom observation of other teachers, or self observation, will confirm this for you. Ask someone to visit your mixed-ability class and observe you and the students; visit an upper-stream class or a lower-stream class, or ask someone to observe you when you are teaching one. It is tough but revealing. Ask your observer to look particularly at who is making the running – controlling how the teaching is done. Usually it is the children who control the teacher's behaviour.

In mixed-ability classes the teacher responds and interacts with some students, others are inattentive and often disruptive. All is quietened when everyone sits and copies or takes notes from dictation. Check the SES of those who responded and those who were inattentive and disruptive. Ask about the locus of control of differing children with questions such as:

> Are you often blamed for things that are not your fault?
>
> Are some kids born lucky?
>
> Do you think your parents should let you make most of your own decisions?
>
> Most of the time do you think that you can change what might happen tomorrow by what you do today?
>
> When you do well in a test is it because the test was easy? Or because of the work you did?
>
> When you don't understand in class is it because the teacher didn't explain carefully? Or because you didn't listen carefully?

In a 'bright' streamed class (SES 1 and 2; internal locus of control) you probably have no great trouble teaching the children so that they pass tests and examinations. You will find, by questioning that your students' and your own cultural or life beliefs are congruent.

In a less able class (probably SES 4, 5 and 6; external locus of control) you find you are teaching children to fail tests and examinations. Your students' and your own cultural and life beliefs are not congruent. The children, by their behaviour, force you to maintain order by giving lots of note taking, and diagram copying. But exams ask for more than regurgitated facts; they require comprehension and 'thinking'. The students force the teacher to behave in this way because they believe that it is the teacher's job to do this. The students misbehave if the teacher tries to enter into dialogue. The students 'know' that success will come if the teacher works hard and 'gives them the goods' and they 'get it all down in their books' even though they don't understand what they are writing.

The second step in increasing the success of our students is to recognise that they control our behaviour according to the way they believe that we can help them succeed. But doing what they want does not lead to success.

Action: What to do now

So what we can do? If we want them to succeed we have to change their beliefs. That is, the beliefs of those students of socio-economic status (SES) 4, 5 and 6, who are in low-stream classes or who are the disruptive students in mixed-ability classes.

What is needed, above all, is the opportunity for talk, so that the student is able to reformulate the words, internalise them and thereby attach meaning to them. But the students won't allow it. They respond with a lack of interest and disruption. Nevertheless we must continually attempt to enter a dialogue and empower the students by explaining what is happening. Only by dialogue can we get them to realise what the situation is. When we are met with a lack of interest we must persist in spite of it.

As well as the 'full frontal' attack there are more subtle ways of conducting this dialogue. I will describe some, but good classroom management is needed before the subtleties of meaningful education can take place. Good classroom management can be achieved in different ways and can vary with classes and the personality of the teacher. Observing other classes and discussions with colleagues can equip us with a repertoire of techniques; from these we can choose which ones are appropriate at different times and with different classes.

Techniques

Some teaching techniques that are useful in teaching students with an external locus of control:

1 Cloze test everything. This is to make sure that the reading levels are appropriate for the students. The method is in Appendix 1. General reading levels will not do.
2 Use language that is very clear, reduce the number of polysyllabic words and the sentence length.
3 Use **interactive** teaching techniques. Get the pupils to tell you what they know and teach from there. Assume nothing; particularly about what they are *supposed* to know.
4 **Do not give notes, nor write the answers on the board. Do not give precis. No notetaking if at all possible.**
5 Use the spider diagram method of teaching. This is explained in Appendix 2.
6 Be aware of what you are asking students when you use certain words. See Appendix 3 for these words.
7 Divide your work into two-week units so that 'the end is in sight'. As far as possible make each lesson stand alone.
8 Discuss with the students what they will be able to do, or will have learned by the end of the lesson and by the end of the unit; that is, let them know the goal of the lesson. Help them to make their own realistic goals.
9 At the end of a unit discuss the assessment with the student and draw up a method of assessment together. Involve the student in assessing him or herself. Help them recognise and know their own strengths and weaknesses.
10 Be prescriptive, tell the students what to do, describe to them the concrete actions they need to take to achieve goals. When you set projects, list the things needed to be done, and how to do them. Direct and Indirect teaching is explained in Appendix 4.
11 Tell the students when they are achieving their goals through these actions. Give plenty of positive feedback. Give guidance when the goals are not being achieved, and use sanctions when the goals are not being pursued. (See *Assertive Discipline* by Lee and Marlene Cantor.
12 Discuss social class and cultural differences, and the differences in knowledge *frameworks* that exist between yourself and the pupil. Discuss the purpose of your lesson, what you are doing and what the pupil is doing. Discuss society, and examinations, and achievement. Keep this up, week after week. Nag about **how** to achieve.
13 Practical subjects have a different overall structure but the aims could be the same as for non-practical subjects. The organisation of the practical lesson could be determined by the questions asked and the order of asking, rather than a fixed syllabus-defined order. Use what the students think life is like, and their perceptions of work, as the starting point and build from that base.

Asking questions which get minds working on new paths is essential: Have you seen.....? How do you...? What do you know...? Tell me about your...? What do you think? How shall I do this? What shall I write? How shall I describe it? What words would you use? What would you do now?

The aim is to extend their framework of beliefs in a non judgemental way:
What is another way of...? What other words are possible? What other things would...? This could be...?

Notes

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Appendix 1

Close Tests

Introduction

The cloze test is a straightforward method of assessing how well a pupil can read in your subject. It is not a test of general reading ability. The results relate directly to how well the pupils can read the textbooks you will be using. It is most important that the procedures outlined below be followed *to the letter*.

Compiling the Test

Select a passage from the book or material to be used. Omit every tenth word, and leave a blank. There should be forty blanks left. It is often desirable to tell the pupils what the passage is about, or to include a heading.

Giving the Test

(a) Give each pupil a copy of the test and get them to write their name (or a number for anonymity) and class at the top.

(b) Explain the point of the test to the pupils – i.e., that this is an exercise designed to show how well they will be able to read their textbook(s) this year or for this unit of work.

(c) Tell pupils to answer the test by writing in the blanks the words they think make the best sense. They should choose their words by looking at the rest of the sentence and surrounding words.

(d) Don't set a rigid time limit for the test. However, if a pupil has not finished after 20 – 25 minutes, it is very unlikely that he or she will be able to do any more.

Marking and Interpreting the Results

(a) There is no reason why a more senior or bright class should not mark the tests, providing it is done accurately and that anonymity is preserved. Do not, however, allow classes to mark their own tests.

(b) Give 1 mark for each correct word. The word *must* be the word in the original passage – ***a synonym is an incorrect anwser***. However, mis-spellings are allowed as correct answers.

(c) All tests have a total mark of 40. Results can be interpreted as follows:
    (i) 18 – 40 marks (45% – 100%): Pupil can read and understand the textbooks.
    (ii) 10 – 17 marks (25% – 44%): Pupil will need assistance in reading textbooks.
    (iii) 0 – 9 marks (0% – 24%). Pupil will have extreme difficulty in reading and understanding the textbooks.

(d) Keep the marks in your mark-book and use the results constructively.

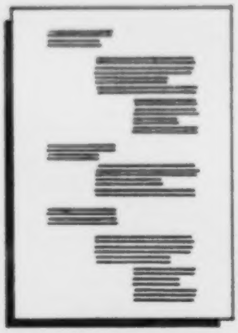
Appendix 2

Spider Diagrams and Interactive Teaching

(Adapted from Tony Buzan)

Ability is a product of how the brain is used. People generally retain less than 5 percent of the material presented in a lesson when questioned 24 hours after the lesson. That means when you begin a lesson based on a previous lesson your pupils really don't know what you are talking about. Knowledge or learning is consolidated by reviewing the work. That's why we remember the lessons we teach – we review them each year. Knowledge is assimilated more easily if it is linked to a framework of knowledge.

Conventional notes look like this:



A 'good' teacher gives notes like this:

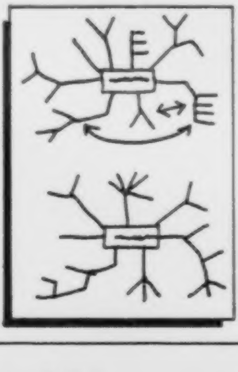
In both cases, the teacher does the work, the student stores it not in the brain but in the school bag.

How can we facilitate better learning within a framework, make it interactive and linked to the pupil's framework, and encourage students to review and revise their work?

Here is a better way to teach:

Plan the lesson and the goal. Tell the students the topic. Write it in the centre of the board. Discuss the topic with the students and write sub topics as branches from the centre core. The students copy and construct their own 'spider'. On a separate page they write definitions, lists to rote-learn, or definitions.

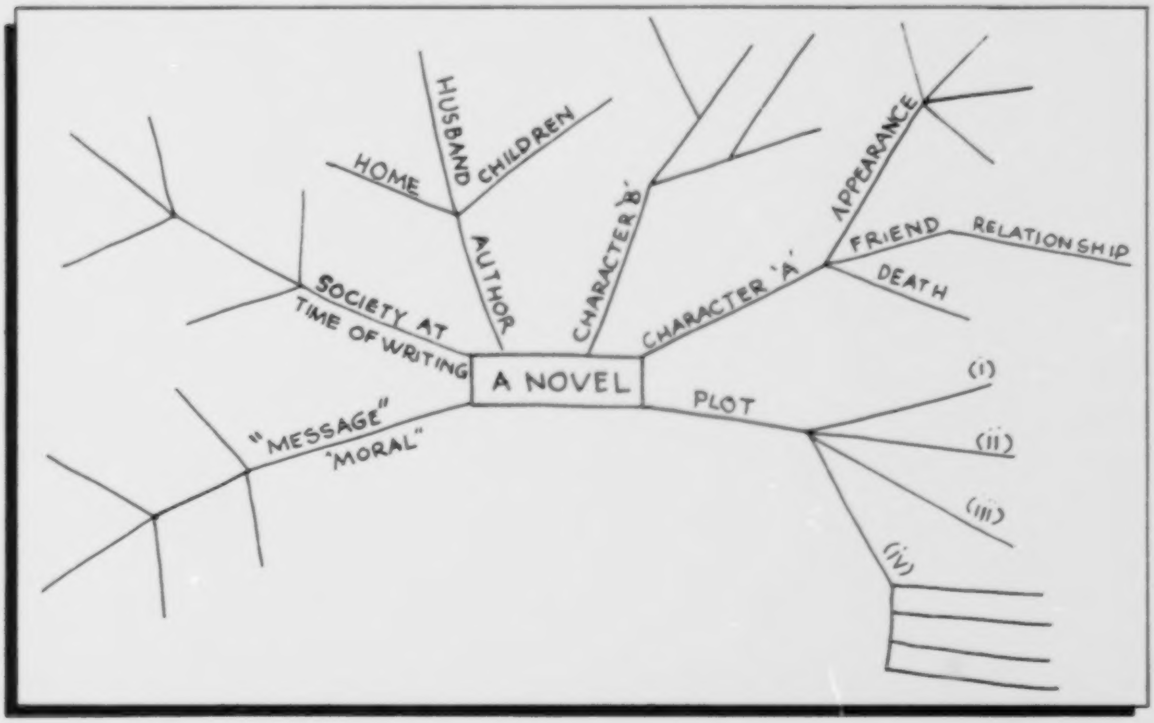
Spider Page



Rote Page

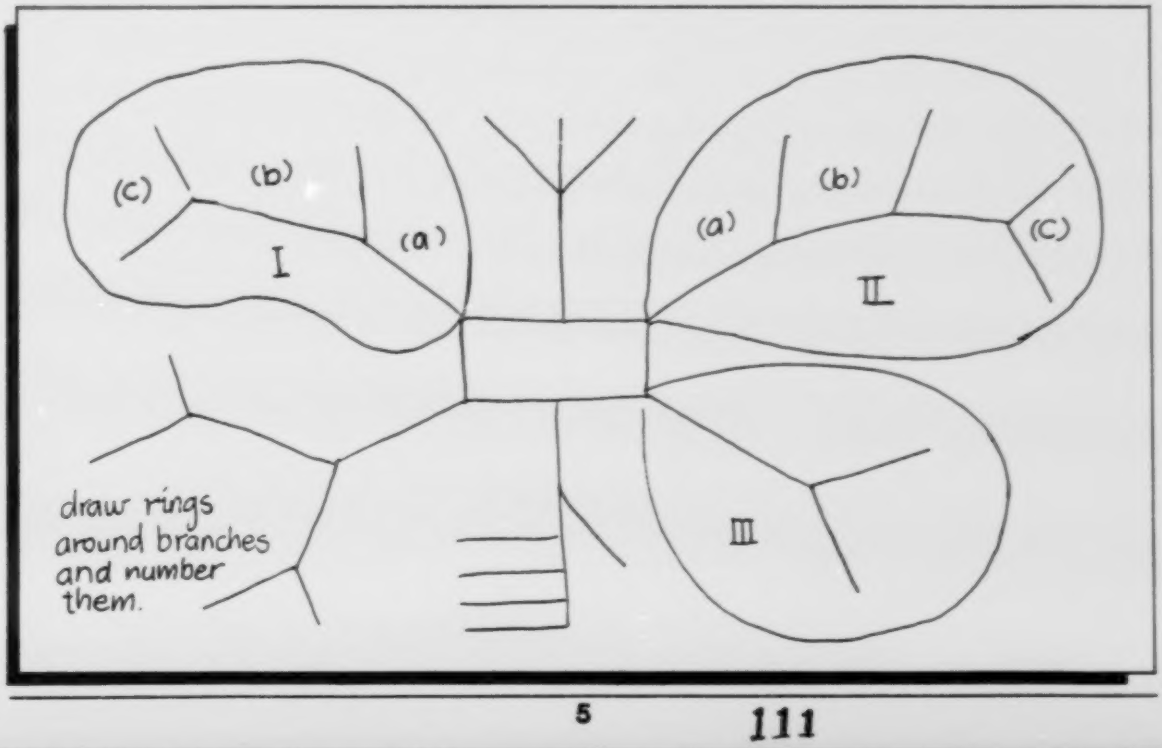
Example of a Spider

In this case the topic is A NOVEL, but it could be Photosynthesis, World War I, Prejudice, Quilting, Transistors, Topology, Word Processors, Screw Threads, a Lesson Plan, an Essay, a Strategy... anything you are studying or need to organise. Similar ways of organising are described in an article in ***set*** No.2, 1989, *Pattern Notes: a New Learning Strategy* by David Jonassen (Item 4), and in *Overcoming the Matthew Effect: Solving Reading Problems Across the Curriculum* by Tom Nicholson (NZCER, 1991).


HUSBAND
HOME
CHILDREN
AUTHOR
CHARACTER 'B'
APPEARANCE
FRIEND
RELATIONSHIP
DEATH
CHARACTER 'A'
SOCIETY AT
TIME OF WRITING
A NOVEL
PLOT
(i)
(ii)
(iii)
(iv)
"MESSAGE"
'MORAL'

The framework links knowledge. The spider is built as you talk to students and they, with their heads up, talk to you. It is interactive – you and they explore the knowledge together.

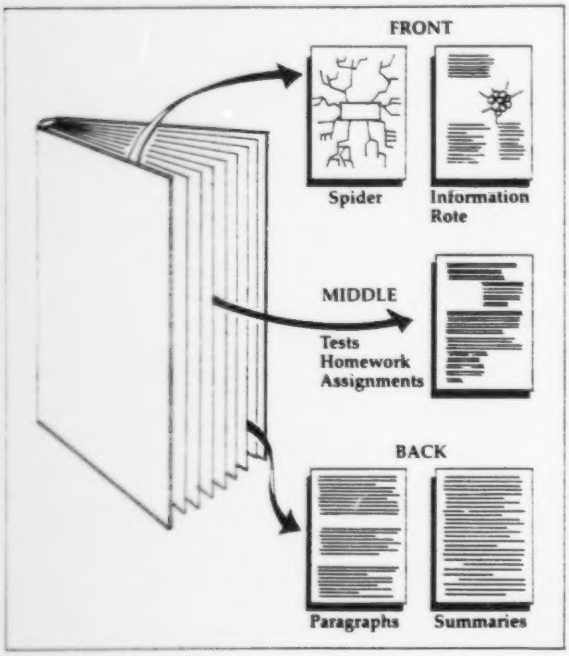
The **first review** by them is when they convert the spider to conventional notes at the back of their book, either at the end of the lesson, for homework or next lesson. The spider structures the notes. You can help initially by guiding the students by indicating sentence and paragraph order. The more important points are near the centre, the details towards the ends of the branches.


(c)
(b)
(a)
I
(a)
(b)
(C)
II
III
draw rings
around branches
and number
them.

The **second review** is at the end of the unit. (Make it two weeks if you can.) At this stage ask the students to summarise all the previous paragraphs they have written and set them an assessment test.

The **third review** is the half year or end of year examination.

A pupil's note book thus has the following structure.



Appendix 3

Key Words in Designing Questions

Analysis of Question Categories
(Based on Bloom's Taxonomy of Learning)

LOWER ORDER

Memory Recall
define
recall
recognise
identify
state
describe
name

MIDDLE ORDER

Comprehension
restate
paraphrase
expand
summarise
compare
contrast
group
predict

Application
apply to
make use of
transfer to

HIGHER ORDER

Analysis
find
detect
link
distinguish

Synthesis
produce
plan
propose
create
design
generate
combine
generalise
reorganise
invent
hypothesise
speculate

Evaluation
judge
defend
argue
appraise

Closed Question – a correct answer is required

Open Question – invites speculation

Appendix 4

Characteristics of DIRECT and INDIRECT Teaching

(Based on work by Don Hunkin)

	DIRECT	INDIRECT
Source of Content	– course externally prescribed – clearly defined progression of content followed by all.	– only starters given and children make their own way. – progression determined by each group
OBJECTIVES	– detailed in the prescription – direct learning experiences – emphasise intellectual development – short term	– arise as students find their own way. – what the child does generates the objectives – experiences general learning as important as cognitive – long term
FOCUS	– teacher directed, pupil centred – analyses knowledge and skills – task completion – both individual and co-operative styles used.	– pupil directed – works to the potential of the environment – how the task is done is important – encourages independence and initiative in the use of resources
SUPERVISION	– closely monitored, immediate help available if needed. – feedback from teacher – objective evaluation	– loosely supervised individual and group work – intrinsic, self feedback emphasised – subjective evaluation
LEARNING ACTIVITIES	– formal scheduling – specific skills emphasised – a clear sequence of directions and specific tasks	– flexible scheduling with large time blocks – integrated studies – interest based, pupil finding his/her own directions

Pupils with an external locus of control learn best in a direct teaching environment while pupils with an internal locus of control do well in both the direct and indirect teaching environments.

TEACHER EVALUATION FORM

H/F3

Forward Employment Checksheet – Summative.

Educational workplace Chief Executive to complete and return to Human Resource Manager by this date: ..../......./399BC

Teacher: Socrates

A. Personal Qualities

	Rating (1 high 5 low) 1 2 3 4 5	Comments
1. Personal appearance	☐☐☐☐☒	Overweight, dresses in a sheet, immodestly draped at times.
2. Self confidence	☐☐☐☐☒	Not sure of himself – always asking questions.
3. Use of language of instruction	☐☐☐☒☐	Strong local accent.
4. Stability	☐☐☐☐☒	Threatens suicide when criticised.

B. Management Practices

	1 2 3 4 5	
1. Organisation	☐☐☐☐☒	Does not keep a seating chart.
2. Room appearance	☐☐☐☒☐	Does not display student's work – prefers to teach outside
3. Utilisation of resources	☒☐☐☐☐	Very economical – uses no consumable materials.

C. Teacher-Pupil Interface

	1 2 3 4 5	
1. Tact and consideration	☐☐☐☐☒	Places students in embarrassing situations by asking questions.
2. Ability to establish warm relationships with students	☐☐☒☐☐	Good, but students show signs of unhealthy hero-worship.
3. Systematic establishment of classroom routines	☐☐☐☒☐	Is always available to inquirers but has established no routines for his students.

D. Techniques of Teaching

	1	2	3	4	5	
1. Long term preparation	☐	☐	☐	☒	☐	Expounds this clearly but has nothing written down.
2. Daily preparation	☐	☐	☐	☐	☒	Does not keep lesson plans.
3. Variety of techniques, (Group-work, peer-help repetition, discovery, etc.)	☐	☐	☐	☐	☒	No variety. Uses questioning exclusively.
4. Skill in adapting teaching style to the needs of students and subject content	☐	☐	☐	☐	☒	Teaching style suits limited subject content, does not suit many pupils.
5. Integration of programmes	☐	☐	☐	☐	☒	Many topics covered but allows student to wander off. No attention given to basic skills.
6. Knowledge of curriculum	☐	☐	☐	☐	☒	Does not know material – has to ask questions to gain knowledge.

E. Professional

	1	2	3	4	5	
1. Relationships with Principal or Chief Executive	☐	☐	☐	☐	☒	Refuses to work under others.
2. Relationships with other teachers	☐	☐	☐	☒	☐	Disputatious.
3. Professional development (courses attended, etc.)	☐	☐	☐	☐	☒	Nil. Thinks he is wiser than anyone else.
4. Professional ethics	☐	☐	☐	☐	☒	Does not belong to a professional association, nor any parent/teacher group.
5. Relationships with Parents	☐	☐	☐	☐	☒	Needs to improve in this area – parents are trying to get rid of him.

Recommendation:

Does not have a place in education. Should not have his contract renewed.

This is an adaptation of 'Evaluation of Socrates' by John Gauss, originally published by the American teachers' monthly, Phi Delta Kappan, in January 1962.

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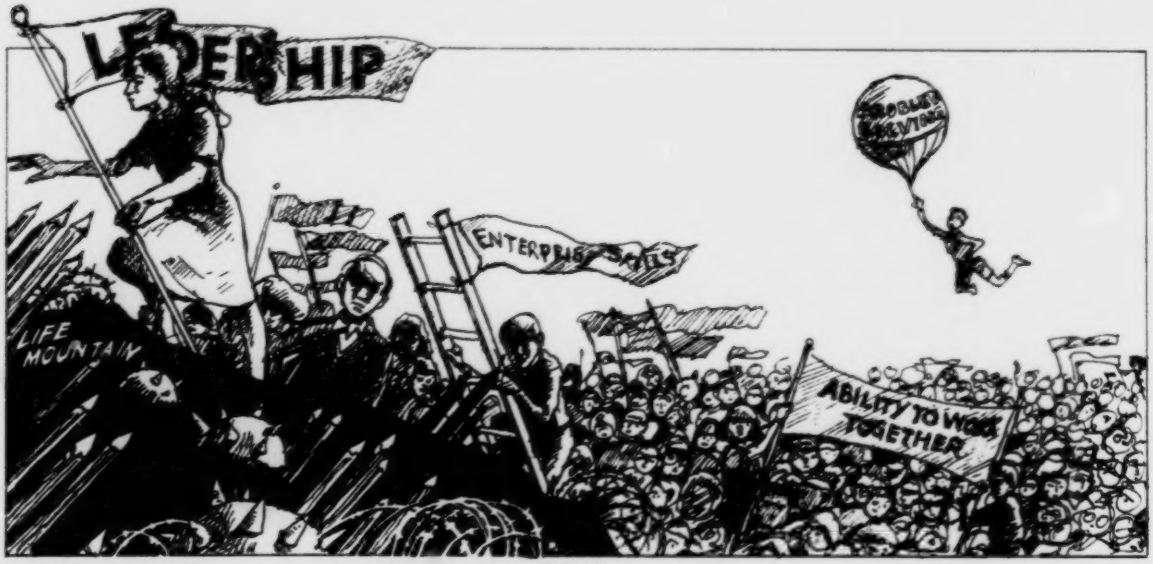
set research information for teachers
number two 1992

THE CRISIS IN EDUCATION

John Raven
Edinburgh



John Gillespie

IN THIS ARTICLE it will first be demonstrated that those who think that the educational system should be fostering the competencies which make for enterprise are correct. Thereafter the often surprising barriers which must be overcome if educational programmes which foster such qualities are to be more widely introduced are discussed.

Overview: fostering competencies

Education involves fostering competencies rather than conveying knowledge.

Most official documents which specify the goals of general education emphasise

(1) problem-solving,
(2) the ability to work with others,
(3) enterprise skills,
(4) leadership
(5) the ability to understand and influence what happens in society.

This is true for the UK, the US and other countries. (References are given at the end of this item.) Readers of ***set*** will know of Australian and NZ equivalents too. These views are echoed in surveys of the opinions of teachers, pupils, parents, employees and employers. The opinions of all of these groups are supported by research into the qualities which are actually required at work and in society.

The five qualities which have been mentioned, and others like them, are required by machine operatives, navvies, bus drivers, small businessmen, civil servants, doctors, scientists, managers, and by politicians. They are also required to use leisure in a satisfying way and for economic and social development.

At the present time, these qualities are at a particularly low ebb in some countries. I find in the UK that there is very little interest in innovation, finding ways of doing things more efficiently, finding new things to do, or better ways of doing them, working as part of a team to accomplish a worthwhile goal, contributing to a public debate about what is in the long term interests of society, or working for the long term good of society. Understanding such concepts as 'participation in management', 'industrial democracy', 'management', and even 'wealth' is highly dysfunctional: participation means sitting on committees, or, doing the manager's job for him or her; not, as in Japan, contributing to the clarification of organisational goals and how they are to be achieved, or, learning through sharing the managers' thought processes how to engage in high level management activities.

Despite the importance of encouraging these competencies, values, and this understanding, most schools – at least in the UK, France, Belgium, the USA, and Australia – do not even attempt to foster them. As a result, schools are among the least developmental institutions in our society. In the USA more than two-thirds of 20 year olds say they were better able to identify and develop their talents at work than they were able at school. Not only do schools generally fail to foster these qualities, many actually stifle them. Some schools encourage inappropriate beliefs, understanding and values such as the belief that it would not be appropriate to try to find more important things to do, or better ways of thinking about things, or how to get authorities to do the things one wants them to do. Perhaps two-thirds of the money spent on secondary and third-level 'education' is wasted. Nowhere in the world has efficient full time secondary education for all been provided. Yet OECD countries spend more than 12 percent of GNP on 'education'.

The fact that we spend so much on a useless activity is not, in itself, a bad thing: the great engines of economic development have always involved useless activities. These have included building pyramids and churches, trading in opium or gold, and building nuclear 'defence' systems, and developing a warehouse, transportation, banking and accounting system which makes up two thirds of the 'cost' of every article.

Barriers to continuing to provide 'useless' education

There are, however, vigorous campaigns against continuing to pay for a costly but useless educational system. These hinge on the public's disillusion and mistrust.

1. Public awareness

The general population is now well aware that the educational system has been unable to deliver the promised benefits: economic and social development, jobs for all, equality, and the opportunity for each pupil to identify, develop, and get recognition for, his or her talents. Despite more education, dole queues grow, the rich get richer, the poor get poorer and much talent is wasted. People who are campaigning for change in education know this.

2. Public mistrust

More and more people can see through educational talk. They know that when most educationists speak of 'developing human potential' they mean creating jobs for their own children or their colleagues. Teachers, unfortunately, engage in double talk; it lets them think that it is legitimate to have an extremely expensive system which does little more than allocate occupational position and status. The public now mistrusts educationists.

3. The certification dilemma

The third reason why it will in future be more difficult to justify useless education is that many people now understand the horns of the certification dilemma. On the one hand, examination courses do not make you more competent (no matter whether you pass, or fail). On the other hand, educational 'qualifications' are used to control entry to jobs (and thus create protected occupations whose members are able to command high salaries because of the 'shortage' of 'qualified' personnel). As a result, certificates which afford entry to protected occupations have great economic value. People are therefore prepared to pay heavily for an opportunity to compete for them – especially when teachers claim to be able to help them to compete successfully. As the public has become aware of this dilemma they have demanded a more cost-effective, 'no frills', educational system and emphasised the need for a single, clear, and unarguable criterion of merit for allocating position and status.

Despite these problems, many people still recognise that educational environments could (and should) develop skills and talents. This is why many people still insist that schools should embrace more of the wider goals of general education. In our surveys more than 50 percent of pupils wanted schools to do more to achieve the objectives we asked about. Those aims of problem solving, working with others, enterprise, leadership, influencing society... these are still desired.

4. Barriers to re-deploying existing resources

Educational policy makers want to re-deploy existing resources. But they have to do so in a situation in which there is considerable resentment at what is going on, hostility toward those responsible for administering the system (the administrators have, after all, conned the public in the past), hostility toward those who are likely to do well out of it, and widespread recognition that what is going on at present is not good education, but is, nevertheless, extremely important to those who want to get a job and 'get on'. This means that teachers who are able to work the system for the benefit of their pupils will strenuously resist change. So will those pupils and parents who are doing well out of it.

5. Other barriers

If these were the only barriers to introducing a more developmental and cost-effective educational system, those interested in promoting it would have a hard enough task. But these are not the only barriers. One of the other barriers is that the good education is most easily provided at home, in communities, and in the workplace – not in school. By good education I mean that programmes that foster qualities like: the ability to make one's own observations; the ability to identify and solve problems; the ability to take initiative; and the ability to get other people to work together effectively. These demand educational processes which schools find difficult.

Fostering competencies in workplace and school

1. Individualised learning

If one is to foster the abilities just mentioned, or the five similar qualities mentioned at the beginning, one must create situations in which people can practice doing these things (and thus learn to do them more effectively). Yet these are all difficult, demanding and frustrating activities. No-one is going to make the effort required to practice them unless what they are doing is important to them. This means individualised educational programmes – each child getting a programme that engages his or her values, priorities and talents. It also means that the 'learning' tasks must be important to society, not unrelated drills or exam cram.

2. Learning by example

Practise is not the only way in which qualities like initiative, adventurousness, and leadership can be developed. People can also learn from the example of others. But you have to be around people who are doing important things. And that includes being alongside them in such a way that you can share in their thought processes, their feelings, their anticipations, and their reflection on things which have gone wrong. In this way you can learn to be sensitive to the cues which beckon and point toward an activity which is likely to pay off, which tell you when corrective action is necessary, or which tell you that things are getting out of hand and you had better either get help or stop. You can learn how to turn a chance observation to advantage.

3. Learning on the job

Two sorts of experience are special: experience gained in the course of working on tasks which are personally important, and experience gained when working with other people who share your own concerns. Researchers like Lyle Spencer have shown that effective supervisors and managers think about their subordinates, place them carefully, and develop their talents. Being competent this way distinguishes effective from ineffective supervisors and managers. Our own research shows that managers in Japan and Singapore do these things as a matter of course. No-one other than supervisors and managers can provide such assistance throughout life; it follows that supervisors and managers, have a crucial (if non-conventional) role to play in the process of developing the talents of young people.

4. School-based programmes

Fortunately for ordinary teachers, work is not the only setting in which such qualities can be fostered. If teachers adopt appropriate forms of interdisciplinary, competency-oriented, enquiry-based, project work, then educational environments can be made more developmental. This teaching curriculum must be grounded in the environment around the school and it must explicitly set out to embody the important features of work – a *real* task to do, variety, and tapping a wide range of alternative talents. In this context it is of great interest to note that more effective teachers, like more effective managers, are the ones who think about, harness, build upon, and develop the talents of their pupils. And they are also more likely to share their own thoughts, their own strivings, and their own feelings with them.

Unfortunately such teaching is threatening to many of those who have dedicated themselves to traditional forms of education.

The resources required by teachers

A major barrier to introducing competency-oriented education into schools is that, if teachers are to foster such qualities, they need to be able to assess each student's concerns, interests, and talents, invent an individualised developmental programme for each student, monitor his or her reactions to those experiences, intervene to take corrective action when necessary and, at the end of this difficult and demanding process, identify the particular competencies which each student has developed in such a way that they will stand to the student's credit when the time comes to scramble for a job. This is an extraordinarily demanding set of activities. Our research suggests that only about 5 percent of teachers manage it effectively.

To implement education to nurture high level competencies it is necessary to devote a great deal of time to guidance, counselling and appraisal. It is also necessary for the teachers to have both a good theoretical framework to enable them to think about the talents which might be developed and the ways in which they are to be developed, and tools to help them.

Such demands may seem unrealistic. But the reality is that such diagnostic and prescriptive tools are required if teachers are to foster even such fundamental competencies as the ability to read. This may strike you as an absurd statement – until it is acknowledged that very few children – particularly those who have learning difficulties – learn to read at school. In Britain as Tizard has shown, it is parents (not teachers) who, in general, provide the sensitive help and encouragement which is required to enable children to find material which interests them and who provide the individualised help which is required to identify the child's specific difficulties so that remedial action can be taken.

Another barrier to the wider introduction of multiple-competency-oriented educational programmes into schools is that the qualities we have been discussing are value-laden. People will only practice and develop these competencies in the course of pursuing goals they value. To be competent you need a view of society and your role in it; especially you need to feel that you have a right to ask questions, a right to expect people in authority to answer those questions, and a right to seek to influence wider social constraints. Many parents, teachers, managers and politicians find this notion threatening – if we teach children to ask awkward questions, to demand answers, to take part in politics, what will come of it all? Some parents, teachers and politicians lack the competencies which are required to manage independent, thoughtful, people who identify and tackle their own problems.

Re-educating teachers and parents

One corollary of this observation is that much 'education' is directed towards the wrong people. The most important targets for educational programmes are teachers, not pupils; managers not employees; the leaders of our society, not 'the disadvantaged'; adults not children. We can no longer lay the blame for our social and economic ills at the door of the poor, the ill educated and those who are least advantaged in the educational system.

A second corollary is that any attempt to introduce genuinely educational programmes into schools will be met by opposition at all levels, from Parent/Teacher Associations upwards. Parent committees which aspire to influence the curriculum repeatedly dissolve in internal strife. All their members want change. But as soon as some of them start talking about encouraging question-asking, independence, initiative, or adventurousness, chaos ensues. Some parents, worried that they will no longer be able to control ('manage') their children, start to raise doubts. It is then suggested that their children need not join the programmes. This in itself creates problems because it challenges deep-rooted beliefs about equality and uniformity in public provision. It is feared that the children of the more articulate will, yet again, get the best deal.

But, before long, a more serious objection emerges. What is being said is, not that these qualities are unimportant, but that they are *too* important. If schools helped some pupils (and not others) to develop them, those children would do better in life than the others. That would be unfair. This is one example of one of the most important dilemmas facing educators: many people want their children to obtain the benefits of problem solving, working with others, enterprise, etc. But they often do not want their children to possess those competencies (e.g., independence); they do not want their children to devote their time to their careers – or even to improving society – if this means reducing the time they spend with the family. They do not want their children to become socially and geographically mobile, to work in distant cities or other countries, to change their language or their cultural beliefs. Often this is particularly so if education means that their children are likely to neglect them in their old age.

So it becomes clear that 'successful' education for modern society involves tackling some of the wider social constraints. It probably means encouraging pupils to change their ideas, and it means influencing their beliefs about society, how it is structured, and how it should work. Some parents see this as political brainwashing. (And we are all quite right to fear brainwashing). In Britain the Manpower Services Commission (MSC) has found itself in precisely the same trap. It asked schools and employers to foster those qualities which make for enterprise and personal effectiveness. This led schools, colleges, and employers to encourage their trainees to consider political processes. The MSC reacted by banning political education!

Neither the members of Parent/Teacher Associations, nor teachers in general, are equipped to handle the tensions which stem from the value laden nature of any education worth the name. As a result, attempts to introduce educational programmes which would foster these qualities simply die. Schools end up working toward the lowest common denominator in education i.e., 'working class values' ('sit still, do as you are told, learn what is put in front of you') and examination achievement.

Ironically, in Britain, the strength of private schools is that they can avoid this dilemma, can foster these more important competencies, and inculcate both values and political beliefs. Their very effectiveness in these overwhelmingly important 'non-academic' areas is precisely why they are so unpopular with parents who would refuse to send their children to them even if they could! British public (i.e., private) schools work well in strictly educational terms. They lead people to develop self confidence, articulateness, to think they have a right to influence things, to know how to do it, to think they have a right to shake politicians and public servants to get the changes that are needed.

The point is that state schools will continue to be unable to foster the qualities which most people think they should be fostering without radical changes in beliefs. If full effective education is to be introduced into schools, *adult civic* education is a top priority.

Certificating value-laden competencies

A further barrier to wider dissemination of competency-oriented educational programmes in schools stems from the fact that what happens in schools is determined by what is assessed at the point of interface between schools and society. Teachers and schools work towards exams, not towards problem solving, working with others, enterprise etc. Teachers and schools do not work at what are regarded as priorities by ministers of education, government committees, employers, parents, teachers or pupils, or employment markets. Two things are needed: (1) schools must foster the qualities we have talked about and find ways to assess them, (2) employees must be able to get credit for qualities they have developed 'on the job' (and thus become able to compete for promotion with those who enter their occupations with higher 'educational' 'qualifications') that is, some way of assessing these qualities must be found.

The thought of assessing these value-laden qualities makes most people (including myself) extremely uncomfortable. Yet I can see no other way of preventing social vandals getting the most senior positions in our public and private sector organisations. Nor can I see any way of avoiding the problem that evaluation research tends to focus on the goals which are easily assessed (and neglects the more important goals of general education).

The costs of *not* developing new ways of measuring problem solving, co-operation, enterprise, etc., are enormous: these costs include (a) inability to create developmental climates in schools, (b) inability to develop, utilise and reward people's talents for their own benefit (and for the benefit of society), (c) inability to undertake useful evaluations, and (d) inability to keep people who destroy society out of influential positions. As well as assisting the development of means of assessing these essential qualities, we must, as a stop gap, think about how to guard against the misuse of present assessment – particularly credentialling exams. This means ensuring that their use is publicly supervised.

Innovations needed

A final barrier to the dissemination of competency-oriented educational programmes stems from the forms and procedures of accountability employed in the education service. At present, teachers are not really expected to pay attention to their pupils' needs and concerns and then invent better ways of meeting their needs. Rather, they are viewed as mere hired hands whose job it is to do the bidding of representatives (boards) for day-to-day running, and distant political representatives for curriculum and policy.

To overcome this problem we need to develop new expectations of teachers, new criteria of accountability, new tools to help us to find out whether those criteria are being met, and new structures to promote and encourage innovation.

1. Expectations of teachers

We should expect teachers to invent ways of tapping individual pupils' motives and meeting their needs. We should expect them to stimulate, and thereafter contribute to, the debates which are required to evolve new ways of thinking about society. We should expect them to contribute to the evolution of the structures which are needed to enable adults to develop the competencies which are required to manage society effectively and to enable them to help each other to develop their talents. We should expect teachers to try to influence the wider social forces (such as the expectations of parents and directors of education, and the narrow range of competencies tested by examination boards) which otherwise so much limit the competencies they are able to help their pupils to develop. We must expect them to insist on the collection of relevant information about how well their pupils are developing and how well their schools and the educational system as a whole is performing and to take the steps which are needed to ensure that good decisions are taken on the basis of that information.

Obviously no one teacher can do all of these things. But the teaching profession does need to encompass and support a significant number of people who do each of them.

2. Criteria of accountability

If teachers are to do the things just mentioned they must be able to get credit for having done so. That is, the criteria against which their performance is judged must include them. The obvious difficulty of doing this leads one to tend to recoil... until one encounters one of those elegant rare strokes of genius. Adams and Burgess have suggested that procedures developed for making statements about pupils' competence be applied to teachers. Teachers would be asked to keep logs of events which went well for them and events which went poorly, what led up to the events, what they did, and what the outcome was. In this way they would be able to get recognition for their concerns, talents and accomplishments.

3. Structures to promote innovation

The structures which are required if a more innovative and more effective educational system is to evolve must promote more contact between innovative teachers. They must also enable teachers to initiate more concerned attempts to advance basic understanding of fundamental educational processes so that chronic problems can be tackled. A network of monitoring and validating groups supported by a measurement and educational research service would meet this need. It cannot be too strongly emphasised that considerable time needs to be allotted to 'parallel organisation' activity concerned with innovation. But this does not mean that more teachers are required. The data which were briefly summarised earlier shows that if teachers spent less time in front of their blackboards and more time managing the educational process, the benefits for pupil development would be substantial.

4. Monitoring structures

To initiate an effective programme of school improvement it is necessary to give teeth to information. We are all too familiar with evaluations which simply gather dust. The work of individual administrators, teachers, schools, clusters of schools and administrative departments, must be made much more public. The network of public monitoring groups proposed would examine the information collected and monitor the action taken. Significantly, such a network of monitoring groups would also help the public to discuss and resolve some of the dilemmas and thus promote the evolution of new ideas about how public institutions should work. Unfortunately, one does not know many people who would voluntarily devote the necessary time to such activities. It is therefore necessary to recognise that, just as such activities are essential to the success of commercial enterprises, so they are necessary for the effective operation and development of society. The implication of this is that they are truly wealth-creating activities and, as such, merit remuneration.

5. New administrative concepts and tools

It is worth making explicit a message embedded in the last few paragraphs. This is that to run modern, information-based, societies effectively we need new concepts of bureaucracy and democracy and new tools to administer them. One of the most important functions of education – significantly not one emphasised by parents, teachers, or employers – is, therefore, to promote the evolution of these new concepts, new understanding, and new tools.

Concluding Comments

I have described some of the causes of the chronic crisis which has persisted in education for the past 25 years and discussed the many non-obvious steps which need to be taken if that crisis is to be tackled. The suggestions which have been made in many ways contradict conventional wisdom. The philosophy of ministers of education and their departments has been that if teachers are told to do things they will do them. If they do not, that demonstrates a lack of ability or goodwill. Such incompetence or insubordination, when discovered, indicates a need for tighter curricula, or harsher staff appraisal systems. 'The lashings will continue till morale improves.' Our work shows that this is naive. The problems in education have multiple and deep-rooted causes. To overcome them we need new ways of thinking about the issues and new ways of doing things. In most cases a great deal of fundamental research is required. However, the research which is needed must be carried out in an action context and must address issues which at first sight seem far removed from the problem.

It is a symptom of the deficiencies in the system, that neither developing better ways of thinking, nor the execution of fundamental research, attract funds. The Technical-Rational model of research (as contrasted with the Reflection-in-Action model of the professions) has become deeply embedded in researchers' thinking. Research is not seen as a route to the solution of pressing problems; rather (in line with the educational system in general) it is seen as a route to personal advancement; not 'What problem are you researching?' but 'What is your PhD topic?' The research establishment has also to put its house in order.

Given that taxpayers have seen through both the educational and the research rhetoric, how can a more appropriate set of expectations and structures be created?

Notes

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The ideas in this set item originally appeared in an article, 'The Crisis in Education' in the magazine *The New Era* Vol. 68, No. 2, 1987, and this is a re-written 1992 version.

Overview: Fostering Competencies

Official documents which specify the five general goals of education include

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MSC (1985) *Two-Year YTS: Guide to Scheme Content and Quality*, Sheffield: Manpower Services Commission.

MSC (1984) *TVEI Review, 1984*, London: MSC.

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Evidence that teachers, pupils and parents think these goals are important (a selection):

Bill, J.M.; Trew, C.J.; Wilson, J.A. (1974) *Early Leaving in Northern Ireland*. Belfast: NICER.

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Raven, J. (1984) *Competence in Modern Society: Its Identification, Development and Release*. Oxford: Oxford Psychological Press.

The evidence that schools do not foster these competencies can be found in, for example,

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Johnston, L. (1973) *The American High School: Its Social Systems and Effects*. Ann Arbor: Institute for Social Research.

Flanigan, J.C. – see above.

Goodlad, J. – see above.

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Morton-Williams, R.; Finch, S.; Poll, C.; Raven, J.; Ritchie, J. (1986) *Young School Leavers*. London: HMSO.

The damaging placement effects of education

Hope, K. (1985) *As Others See Us*: Schooling and Social Mobility in Scotland and the United States. *New York: Cambridge University Press.*

Hogan, R. (1990) Unmasking Incompetent Managers. *Insight* May 21, pp.42-44.

Chomsky, N. (1987) *The Chomsky Reader*. London: Serpent's Tail.

Nuttgens, P. (1988) *What Should We Teach and How Should We Teach It?* Aldershot: Wildwood House.

The problems posed by the sociological functions of education

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That schools actually stifle competency, or in fact promote incompetence, can be found detailed in:

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Chomsky, N. – see above.

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The certification dilemma

Raven, J. (1980) *Parents, Teachers and Children.* Edinburgh: SCRE.

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Collins, R. (1979) *The Credential Society.* New York: The Academic Press.

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Learning on the job

The research of Lyle Spencer can be found in

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Raven, J. (1977) *Education Values and Society:* – see above.

Raven, J. (1984) *Competence in Modern Society* – see above.

Raven, J., Johnstone, J., Varley, T. (1985) *Opening the Primary School.* Edinburgh: SCRE.

Winter, D.G.; McClelland, D.C.; Stewart, A.J. (1981) *A New Case for the Liberal Arts.* San Francisco: Jossey Bass.

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The resources required by teachers

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Tizard's work on who helps children learn to read is found in

Tizard, B. (1984) Staff and Parents Talk to Young Children. In B. Tizard (Ed.) *Early Childhood Education,* London: NFER.

Re-educating teachers and parents

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Concluding Comments

Our work which shows that it is naive for administrators to believe that through central prescription and testing teachers will do exactly as they are told; and that the problems in education have multiple and deep-rooted causes, is detailed in

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Further References

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Burgess, T. and Adams, E. (1980) *Outcomes of Education.* London: MacMillan.

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item 12

set research information for teachers
number two 1992

Kindergarten Children Who Cause Concern

Robin Cook and **Jean Wilson**

Melville Kindergarten, Hamilton

IN EVERY GROUP OF CHILDREN at kindergarten there are some who give cause for concern, usually because of their unacceptable behaviour. Denis Stott in Canada in 1981 suggested that perhaps 20 percent of young children cannot learn spontaneously because their behaviour gets in the way. In a recent study in Western Australia Joy Cullen found preschoolers fell into two groups: there were the 'high-readiness' children who possessed good learning strategies, and the 'low-readiness' children who did not. Those without good learning strategies were easily distracted, flitted from one play area to another, were unable to attend when in formal groups, and were unable to extend their play. Cullen concluded that to help the low-readiness children teachers and parents need to do two things. Firstly, they need to observe to determine which of the child's strategies are ineffective. Secondly, they should intervene – do something – to help the child develop better strategies. Effective ways of dealing with problem behaviour must vary according to its cause. These ideas make a great deal of sense, but how do busy kindergarten teachers translate them into practice? Since at our kindergarten we had several children who gave us some concern, we set ourselves the challenge of trying to find a way.

What we did

We undertook a small piece of action-research, hoping to devise an approach we could use ourselves. The aim was to help children who cannot make the most of the opportunities available in the kindergarten to develop their intellectual, social and other skills. We hope others will find it useful too. Three children who were causing concern were selected for study. We shall call them Susanne, Richard and Michael. They attended morning kindergarten, a preschool programme operating five mornings a week. The children had already spent about 7 months at afternoon kindergarten for three afternoons a week and had moved on to the morning programme at approximately 4 years 3 months old. Following Joy Cullen's advice, the children were each observed closely for an entire morning during which running records (field notes) were kept of their play or work, their interactions with other children and adults, and, where possible, their conversations. We did not have time to do this ourselves but fortunately had available a capable kindergarten parent who understood the programme and had an easy rapport with the children. We did attempt to record the language the children used with a tape recorder in a special jacket the child wore but this was less successful than the field notes of conversations recorded by our parent observer. Following the observations, intervention programmes were devised and put into practice (where necessary), and further observations made.

What we found

1. *The case study children*

(i) The story of Susanne

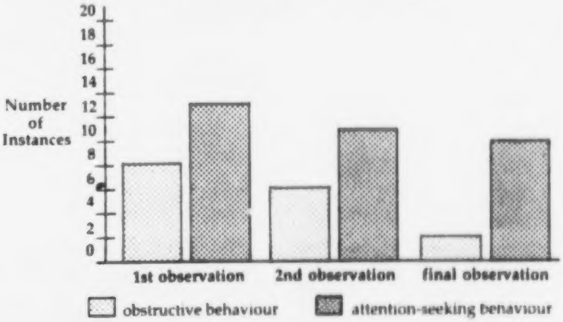
When she attended afternoon kindergarten, Susanne appeared to be a capable, interested child but when she joined the morning programme she began to flit from one area to another and paid little attention in formal groups. Her former high standard of art and craft work deteriorated, and she achieved very little. She displayed mature social skills, but we were concerned that her intellectual potential was not being developed. The initial observation showed something of which we had been unaware; Susanne appeared to be influenced to a large extent by the actions of Richard, our second case study child. He obstructed her interactions with other children and restricted her use of the facilities and materials. Our intervention was to redirect Richard (to reduce his influence) and at the same time we encouraged Susanne to develop a close friendship with another child of similar skill levels. Following this, our informal observations showed that Susanne was now fully involved in all aspects of the programme, used appropriate strategies, and was now using her abilities to the full.

(ii) The challenge of Richard

At kindergarten Richard obstructed other children's play, constantly approached adults, distracted children and adults from the task at hand, and knowingly used equipment and materials in unacceptable ways to attract attention. In behaving this way he also severely restricted his own opportunities to learn since he hardly took part in the programme at all. We began to realise the full extent of his unacceptable behaviour when we started observing Susanne. Our impression was confirmed by a further period of observation (see Chart 1). The first intervention strategy we tried was to encourage Richard to interact with children other than Susanne. Without Susanne to dominate, Richard's obstructive play (and misbehaviour generally) decreased (see the second observation on Chart 1), although it must be added that his interactions with other children seemed quite limited. We made a further attempt to encourage him to interact with other children by involving him in small group work, and directly teaching him a number of social skills. It seemed to us that lack of self-esteem was also a contributing factor in his misbehaviour so we tried various strategies to improve this. These included giving Richard positive reinforcement, providing opportunities where he could feel important by taking a leading role, and introducing a home contact book to help his self-esteem within the family. Unfortunately this seemed to have little success. To increase his involvement in the programme we made a special effort to interest him in various areas, for example, music, and to encourage him to participate. Subsequent observations indicated a definite improvement but sustaining his interest remained a problem. Our last systematic observation (see Chart 1) revealed that Richard's obstructive behaviour had decreased markedly, but sadly his level of attention-seeking behaviour was still unacceptably high. We had no opportunity to try further strategies as Richard left kindergarten to go to primary school.

Chart 1

A comparison of Richard's behaviour during initial, subsequent and final observations



(iii) **The unusual case of Michael**

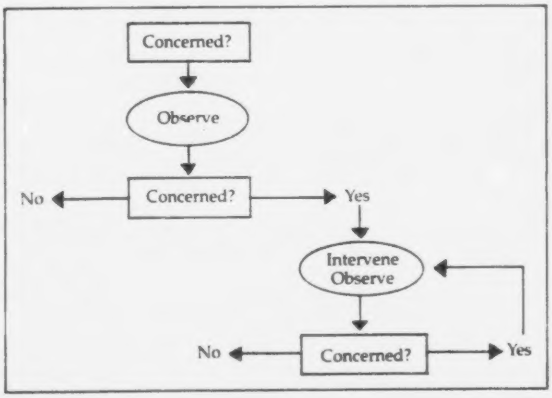
Michael came to kindergarten with a reputation for aggressive behaviour. During the time he attended afternoon sessions he sometimes made quite vicious attacks on other children for no obvious reason. We wondered whether his aggressiveness might stem from a lack of social skills. A full-scale observation was carried out shortly after Michael began morning kindergarten. To our surprise this revealed no instances of aggression or other inappropriate behaviour; we think that there are three possible explanations. Firstly, from being a 'leader' in the younger afternoon group, he became a 'newcomer' to the morning programme and may have adapted his behaviour to that of the others. Secondly, speech therapy helped his articulation, resulting in less frustration as he communicated with others. Thirdly, medication for a health problem was changed at the time he entered morning kindergarten, and his home and kindergarten behaviour seemed to improve as a result.

2. *The approach we evolved*

Our experience with observations and intervention programmes led us to map out the following flow diagram (Chart 2).

Chart 2

An action model for dealing with children who cause concern



Final comments

It may seem obvious to suggest that children who are causing concern be observed closely for a period and that intervention strategies be implemented on the basis of these observations. However, we should like to make three comments about this.

1. To understand a child's behaviour we found it was necessary to have the child observed throughout the session by an independent observer. The resulting record gave us a total picture of his or her interactions and involvement.
2. We doubt that we, as teachers, can be independent observers. The children expect us to be involved in the programme and our presence influences the type of play occurring. An independent observer is able to remain apart from the play.
3. Deciding on suitable intervention strategies is a challenge, as is having all teachers implement them consistently. Strategies chosen will be different for every situation and every child, and their effectiveness determined by trial and error. In complex cases professional help would be necessary.

We should also like to mention some complicating factors. Although Richard's unacceptable behaviour decreased in frequency, we cannot say with certainty that this resulted from our intervention programme. We can only speculate how his behaviour would have been had we not intervened, or if we had intervened in other ways. Another factor is the short time that a child spends at kindergarten – a maximum of 15 hours a week in the morning programme. This may limit the effectiveness of an intervention schedule, unless the child's family is also involved. We feel that there is considerable scope to explore ways in which parents may be helped to become part of the intervention process.

When children's behaviour goes beyond the acceptable, for whatever reasons, it jeopardizes their learning opportunities and hence their development of important learning strategies. In this sense it puts at risk their future education and life-chances. It seems imperative that children with behavioural difficulties be identified promptly at the preschool level, and intervention strategies begun.

Notes

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This research was undertaken as part of an M.Ed. programme at the University of Waikato, Private Bag, Hamilton, New Zealand, under Dr Fred Biddulph.

The figure of 20% of young children being unable to learn spontaneously because of their behaviour comes from the following study

Stott, D.H. (1981) Behaviour disturbance and failure to learn : a study of cause and effect, *Educational Research*, Vol. 23, No. 3.

Joy Cullen's work on high-readiness and low-readiness children can be found written up in

Cullen, Joy (1988) Preschool children's learning strategies, *set : Research Information for Teachers*, No. 2, 1988.

The ways of dealing with problem behaviour must vary according to the cause. This idea is clearly spelt out in

Katz, L.G. (1972) Condition with caution, *Young Children*, Vol. 27, No. 5.

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set research information for teachers
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Helping One Another Learn

DISCUSSION IN JUNIOR MATHEMATICS

Gill Thomas

Dunedin College of Education

IN THE PRESENT-DAY classroom children talk to each other a lot. Independently Gill Thomas at Dunedin College of Education and Joanna Higgins at Wellington College of Education have been observing the conversations of very young children as they do mathematics. In this item and the next are two different, but complementary, analyses of the children's conversations.

A KEY FEATURE of New Zealand junior mathematics is the widespread use of *Beginning School Mathematics* (BSM). It provides a range of activities for children to use independently of the teacher. The most common organisational structure is to group the class into four groups. After some teaching of the whole class together the teacher works intensively with two of the groups in turn while the other groups work independently of the teacher on activities designed to supplement the concepts introduced by the teacher. It is called *independent activity time*. The result is that the children spend up to three-quarters of their mathematics time working in groups independent of the teacher. It is expected that the children will discuss the mathematics they are working on with their peers during this time.

What happens when children work in groups independent of the teacher? What discussion occurs within the groups? How do you encourage children to engage in 'meaning-making' discussion with their group-mates? My study (a pilot for a full-scale research project) sought to investigate these questions.

Method

The most advanced group from each of two classes was selected for this pilot study, along with the least advanced group from one class, the 24 children being between 6½ and 8½ years old.

In the first phase each group was videotaped during mathematics for a week. The videos were examined, transcribed, and what the children did was coded. In the second phase the two teachers and I developed a framework for group work. We hoped it would encourage the children to have meaning-making discourse. The framework had three parts:

1. The collective completion of tasks
   The activities chosen for *independent activity time* were modified to encourage collective work, rather than an individual or competitive approach.
2. The management of independent activities
   The children were encouraged to discuss aspects of management – for example the materials required and the rules – before the independent time activity was begun. The idea was to get these problems over first; then the subsequent discussion could be on the mathematics associated with the activity.
3. Helping one another learn
   The children were encouraged to question one another about the task as they worked on it. There were strategies introduced for giving and receiving help.

The teachers introduced the framework in whole-class sessions, over two weeks. I then worked with the groups we were studying, encouraging them to use the framework.

Findings

Phase 1

What was the nature of the discussion between child and child?

Most of the talk (83 per cent) was related to mathematics. However, most of that was related to task-management, with very little (7 per cent) being discussion which had an instructional element.

In order to provide substance to these findings, all the talk that had an instructional element was analysed for quality. Requests and responses turned out to be of differing complexity. So we made a distinction between higher order and lower order talk. Higher order requests were ones requiring an explanation of how to obtain a solution. For example, 'Will you show me how?' A lower order request simply required an answer without explanation. For example. 'What is 9 and 5?' Responses were similarly categorised.

Very few requests were made of other children (1 per cent). The requests that were made were equally of higher and lower order, although the majority received only a lower order answer.

Anna: *What does that equal* (points to equation)*?*
Lise: *8 take away 7 equals 1.*
Erica: *Is it 10 take away 5 or 5 take away 10?*
Lise: *You can't take 10 out of 5.*

There was only one instance of a child suggesting the use of teaching materials to help another child.

Lise: *8 take away 2 equals 6.*
Anna: *Does it? 8 take away 2.* (Holds up fingers, 4 on each hand, counts off 6 including thumbs which were turned down.)
It equals 4, silly.
Erica: *8 take away 2 does equal 6.*
Anna: *But look.* (Repeats with fingers.)
Lise: *Go and get some counters.*
Take 2 from 8. I reckon it equals 6.
Erica: *Yeah.*
Lise: *She says it equals 4 and I say it equals 6.*
(Anna returns with the counters.)
Lise: *Work it out with the counters. Get 8 counters.*
Anna: *No, Erica.*
Lise: *Leave it to Erica. She's doing it.*
Anna: *OK. 1 2 3 4 5 6 7 8.*
Lise: *OK. Now take 2 from it.* (Removes 2.)
Lise: *You see, it's 6. 1 2 3 4 5 6. It's not 4, it's 6.*

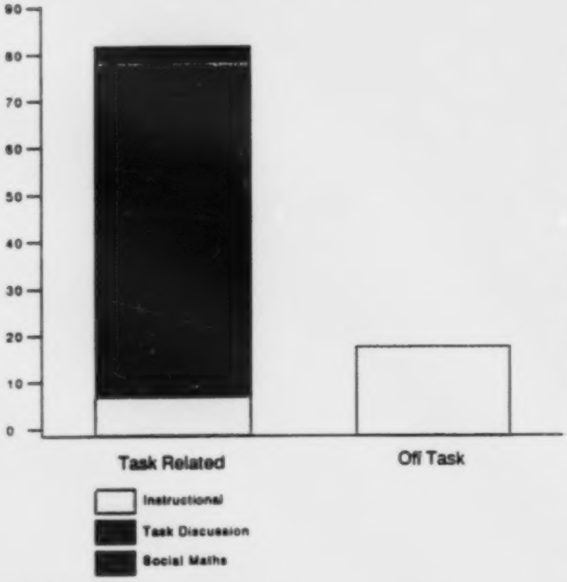
Eighty percent of the responses were unsolicited, that is, most of the children helped (or attempted to help) without being asked. Most of them were of lower order. Here are three.

Sam: (To Steve.) *Sorry, Steve. 10 plus 2 is 12.*

Anna: (To Betty. The card has 9 – 6 on it.) *It's 3.*

Justin: (To Kay about a problem on the computer screen.) *I think you should go up; keep going up.*

Figure 1: Major Categories of Child to Child



Phase 2.

How do you encourage children to discuss mathematics in mathematics time, in a meaning-making way? When we began this phase we did not have the analysis completed so what follows is a summary of my reflections, and those of the teachers, on our attempts to encourage useful discussion.

1. Although there was an effort made to encourage the children to work together many of the activities the children chose to work at during the independent time were treated as competitive – for example *Snap* and *Memories*. Many of those activities had, of course, become popular before I arrived.
2. The hope that groups would clarify beforehand which materials and what rules they would use, was not fulfilled. The groups continued to make decisions about the rules as they worked on a task. It was felt by the teachers that the habit of looking at the materials and rules before starting would have to be introduced early in the year when work patterns for the classes were being established.
3. The children adopted the idea of checking one another as an activity was completed, but more often than not they failed to give an explanation if they identified an error. We wanted to use questioning as a means of encouraging the children to think about the mathematics they were working on. But this was fraught with difficulties. The children were willing to answer questions asked by the teacher but seemed unwilling (unable?) to ask questions of one another. It appeared to me and to both the teachers that many of the activities were not sufficiently challenging. If the children can complete the task with ease there is little motivation to help one another get it done.

Discussion

This study highlights a problem caused by a too ready acceptance of the idea that discussion between children is a tool for learning mathematics. It is necessary to explore the nature of young children's talk before assuming that in their talk they help one another learn. Although the quantitative analysis showed that the talk was usually task-related, this talk is extremely varied and often not useful to the task. Only a small amount of the talk (7 percent) was task-enhancing.

This finding poses the question of whether young children are capable of task-enhancing discussion with their peers. There were glimpses in every group. So I believe that they are capable of such discussion.

How then can teachers stimulate the type of discussion between children which will help them learn? The framework for encouraging discussion introduced into these classrooms did not appear to have any impact. The tasks and work patterns already established had perhaps set the children in their ways.

Another factor influencing the discussion is the social atmosphere in which it takes place. The working context within each group is important and the effect of dominance or conflict within each group needs to be considered. This is the theme of Joanna Higgins work, in Item 14.

The nature of the activity, and the way it is structured, is likely to influence the outcome also. There must be, for example, sufficient motivation to work together and to discuss the task, and the tasks must be capable of being done co-operatively. The dynamics of co-operative learning have been studied, for example by Johnson and Johnson, and can lead to better teaching.

Notes

GILL THOMAS is a Senior Lecturer at Dunedin College of Education, Private Bag, Dunedin, New Zealand. The work described here is the pilot for a doctoral study and is adapted from a paper given to the NZ Association for Research in Education Annual Conference, 1991, and available from the author.

Beginning School Mathematics (BSM) was first published by the New Zealand Department of Education in 1985.

The coding of the transcribed video-recorded child-to-child talk was done following a system devised by Bennett and colleagues, with modifications. It can be found in

> Bennett, N., Desforges, C., Cockburn, A., Wilkenson, B. (1984) *The Quality of Pupil Learning Experiences*. London: Lawrence Erlbaum.

Our finding that only a small amount of task-related talk was, however, task enhancing is consistent with Bennett *et al*'s findings.

All transcripts were coded by a single coder. A random sample of two transcripts from each group (115 utterances) was re-coded to establish test-retest reliability; the proportion of perfect agreement was 89%.

Research on co-operative learning has been carried out by Johnson and Johnson, with most encouraging results. They can be read in

> Johnson, D.W. and Johnson, R.T. (1987) Co-operative Learning, Computer Assisted. ***set*** No.1, 1987, Item 13.

and

> Johnson, D.W. and Johnson, R.T. (1988) Co-operative Learning Strategies for Mainstreaming/Integration. ***set*** No.1, 1988, Item 4.

and

> Johnson, D.W. and Johnson, R.T. (1985) The Internal Dynamics of Cooperative Learning Groups. In Slavin et al (Eds.) *Learning to Cooperate, Cooperating to Learn*. New York: Plenum Press.

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item 14

set
number two 1992

Can I help? I'll be your friend

DISCUSSION IN JUNIOR MATHEMATICS

Joanna Higgins
Wellington College of Education

Kerry Gemmill

Background

For two terms in 1989 I listened to children talking to each other in two junior classrooms in two Wellington schools. The children were working by themselves, independently of the teacher, as part of a programme based on the Beginning School Mathematics (BSM) resources. The independent time in BSM is a rich opportunity for children to interact and through their participation to develop social knowledge.

Friendship

Children maintain order and control of their world through friendship.

> The discovery of friendship is a major step in children's acquisition of social knowledge.... Through interaction with peers, children learn that they can regulate social bonds on the basis of criteria that emerge from their personal needs and social contextual demands. They also learn that their peers will not always accept them immediately; often a child must convince others of his merits as a playmate, and sometimes he must anticipate and accept exclusion.
>
> *William Corsaro*

Adults and children have very different perceptions of friendship. While children see 'liking' as a basis for friendship they also have proximity as a first and basic element. So children become friends through playing or working with each other.

Friendship and Inclusion – Access to Activities

> *Frank: Can I help? I'll be your friend.*
>
> When Tim does not agree Frank pushes him and fighting breaks out. The other boys are now standing at the table watching. James tries to intervene, gets kicked and starts to cry. At this point the teacher intervenes and directs Frank to get out the cuisenaire rod picture-matching activity.
>
> As Frank starts to cover the robot shape with rods he speaks to Tim.
>
> *Frank: You shut up, less I hit you again and make you cry.*
>
> When there is not much response from Tim he continues.
>
> *Frank: Tim, Tim I want to tell you something.*
>
> He then leans over and messes up the jigsaw of the fire-engine that Tim is working on. They start to fight again.

Are these children just 'off-task' or is that a superficial explanation of their behaviour? Children use social knowledge to gain access and acceptance to groups. Rather than offering to be Tim's friend, Frank suggests that he will be a friend by virtue of the fact of working with him on this activity – this being his definition of friendship. Children's references to friendship often signify that the children were now friends because they were playing together and friendship follows a successful attempt to gain access. In the above episode Frank was unsuccessful and was therefore, not able, in the children's use of the word, to be Tim's friend. The same situation on another day may result in Tim allowing Frank to join him.

Acceptability within the peer group is important for all children and rejection is tough – Frank reacted strongly. The fighting that followed Frank's unsuccessful attempt to gain access is typical of the chaotic nature of young children's friendship. Some educationalists even go so far as to say

> children appear [to adults] to have a rather fickle attitude towards friendship, and to engage in an unnecessary amount of fighting and bickering.
>
> *Bronwyn Davies*

However, they need to discover and explore the dynamics of interpersonal relationships. The teacher's intervention dealt with the obvious disturbance (by directing Frank away from Tim) thus restoring order in the classroom. However, as this extract shows, this only stopped the fighting temporarily – the children were still working on their own relationships.

Interactive Space

During the BSM independent activities, the children are free to work by themselves, with a partner or in a small group. Children were, therefore, often in the situation of wanting to join a group working on an activity. However, access is not a simple matter of individual choice. Children have to follow the procedures of their peer culture. On numerous occasions in both classrooms I observed children not being allowed to join in.

This may seem to teachers or adults to be merely selfish or unco-operative. However, these young children are still learning about how social interactions can work best. A useful concept, invented by William Corsaro, is that of 'interactive space.' At this young age children feel a need to protect their interactive space; they

> ...wish to continue to share the interactive experience *with each other;* but they know from past experience that the acceptance of additional playmates often leads to the breakdown of interactive events.

So not letting others join in, is not so much about maintaining control as about protecting the interactive space.

My observations support Corsaro's claim that in most instances children chose to work with others rather than alone. If they are doing an individual activity, most often they do it alongside someone else doing a similar activity. This preference not to be alone has implications for mathematics programmes designed to be done on one's own. Seeking access to groups often ends up in physical or verbal disputes, some of which the teacher has to settle.

Bargaining

Stephen: You snatched it off me.
James: Did not.
Stephen: It's mine.
James: I'll tell Mary on you.
Stephen: When you want some of my lunch I'm not going to give you any.

Here a lunch was used as currency. The conversation took place whilst a group of boys were making a model with big blocks, each working on a different part of the model from a common pile of blocks. This is a good example of the nature of threats and bribery during independent work.

In a similar situation felt-tip pens were used as currency. In this sequence Amy did not think that Karen was doing the group activity properly and threatened to tell on her.

Amy: I'm telling on you.
Karen: Amy.
Lizzie: I thought you liked her.
Karen: I won't let you use my felts.
Lizzie: I'll be able to use her [Karen's] felts. [Instead of you, Amy, using them.]

Karen was surprised that Amy was going to tell on her. Lizzie's comment about friendship suggests that 'telling' breaches the children's code of friendship – friends do not tell on each other. In wanting to 'tell', Amy was signalling a backoff from the group and wanted a crossover to teacher control of the situation. However, using the felts as currency, Karen tries to stave off the punishment and Amy risked aloneness unless she withdrew her threat.

My observations showed that children often used some form of bribery or bargaining to gain access to a group or to stay in one. The 'currency' used for this purpose varied. Adrienne Alton-Lee also observed a classroom where access to felt-tip pens was used as classroom currency. Other forms I saw included birthday invitations, lunch, and friendship itself. Traditionally, much of this type of social learning took place in the playground rather than the classroom. The independent activities of the BSM resource provide a setting for children to get on with exploring peer relationships as part of the learning situation.

Initiation Ceremonies

A model of a police station had been built, using big blocks, by Anthony, James and Billy. Alan, Pip and Michael tried to join in the play by using toy cars as currency. This episode is a good example of the complexity of peer interactions where the three boys wanting to gain access to the group had three different experiences.

The boys at this activity were collecting up vehicles for the joint collection. From time to time they evaluated this collection and decided on its composition.

Michael arrives and is allowed to stay. Alan also arrives, hoping to join in.

Antony: *Go Alan. This is ours, not yours.*

Alan moves away.

Pip is also trying to join. He tried to make a contribution to the collection of vehicles.

Antony: *We've got the police everything. Got the police plane, the police car, the police boat.*

Billy: *Here's batman. Allowed everything green, white and blue.*

The others: *Red. Yellow.*

James: *How about yellow?*

Antony: *We're allowed green, white and blue.*

Pip: *What about a yellow one?*

Antony: *You still can't join, only if it is a good colour. Okay, we'll swop cars.*

A little later Alan managed to give the group some cars. Philip pointed this out to Antony who then changed his mind about Alan joining the group.

Philip: *Antony, we've got heaps of cars. Alan's joining as well.*

Antony: *Oh, I hate him.*

Philip: *He gave us all these.*

Antony: *Oh. [!!]*

Alan tries a bit of 'power play', but very nearly loses his place.

James: *Everyone, Alan's not joining. He's not letting us all on the road.*

Alan relents. Antony shouting from the other end of the model,

Antony: *Okay, I will. [let Alan play]*

Later

Antony: *Pip, you're not joining.*

Pip: *Yes, Philip said.*

Billy tries to get Pip to taste some water on the floor.

Billy: *Just taste it.*

Pip screws up his face and puts a finger in the water.

Antony: *You got piss in your hand!*

The transcripts show how three children all wanting to join an activity can have very different experiences. Michael did not have to, in any way, 'pay' for his place. Alan, on providing some cars, 'bought' his place. But Pip had to both provide cars of a 'good colour' and have an initiation ceremony. These social experiences, power plays, and friendships, are very important to the children because they are part of classroom learning in the context of peer culture. Teachers must allow for them when planning or guiding academic learning.

Rituals

Pip, Piers, James and Mary were on the floor making a model of a zoo with blocks.

Pip: *Get squares for the water.*

Piers: *Mungapungas. Could be mungapungas.*

The teacher and I smile when we hear the word 'mungapungas' and comment on its unusualness.

Pip: *Mrs B. just found out that we call them mungapungas.*

James: *Look Mrs B., look Mrs B., I have mungapungas.*

James: *This is where they sleep. They play all along here.*

Pip: *Look, Mrs B.*

Mrs B: *Marvellous construction over there. What is that?*

James: *These are mungapungas. Mungapungas are funny, eh?*

Mary: *Mungapunga.*

Pip: *This is my mungapunga building.*

Flat, round, wooden blocks with a hole in the centre became 'mungapungas' to all the children in the class. Whilst the children had called them this ever since the beginning of the first term of that year, the teacher did not know where the name had come from. 'Mungapungas' are an example of a shared meaning which can develop through peer play during the independent mathematics time.

The children were fascinated that the teacher knew about their special word. The children had both created and were in control of mungapungas. James' comment 'Mungapungas are funny, eh?' shows how the children were enjoying their creation. The number of times that the children repeated the word shows how they were attracted by the hard consonants and enjoyed saying them.

During the tidying-up time all the children from that group joined in the chanting of 'mungapungas' and became very excited in the process. In this way the 'mungapunga ritual' became a 'group production'. The children tried to collect together as many 'mungapungas' as they could by looking around the classroom for these particular round blocks, even asking the teacher for suggestions of places these blocks might be. Part of the ritual of gathering them up entailed the children 'wearing mungapungas' on their fingers during this collection time while chanting loudly.

Rituals are part of the peer culture. Other researchers have looked at children's rituals and noticed that, 'during the course of peer play, children ... experience a sense of communal sharing and group identity.' Rituals help prepare children for adult life and part of the significance of a ritual is 'the strong feeling of obligation to follow the ritual that all individuals within the community feel.' In discussing why friends are so important, Bronwyn Davies points out that,

> By building with that friend a system of shared meanings and understanding, such that the world is a predictable place, children take the first step towards being competent people within the social setting of the school. Much of this building of shared meanings takes place through play.

Conclusion

I observed the peer culture of two junior classrooms during mathematics sessions. Through peer interactions the children were constructing social knowledge. It is important to consider the total classroom learning context; peer interactions are embedded in the independent mathematics activities and therefore, need to be viewed and handled as part of the learning process.

The children, having a desire to maintain order within their peer culture (through friendships) are often at odds with the teacher's perspective on order. Junior mathematics programmes organised with time for independent activity, could be seen as full of opposing and conflicting bids for survival in the classroom. What teachers see as a challenge to order, is often children trying to construct social knowledge. Rather than these social interactions being merely 'off-task' in relation to the mathematics learning, they are intertwined.

Notes

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The full account of Joanna Higgins' work can be found in

Higgins, J. (1991) *Mungapungas and Brooming Revealed. Independent Learning in Early Mathematics.* Unpublished Masters Thesis, Victoria University of Wellington.

The first quotation, from William Corsaro, can be found in

Corsaro, W.A. (1985) *Friendship and Peer Culture in the Early Years.* Norwood, New Jersey: Ablex Publishing Corporation.

That friendship is so important to children is discussed in

Davies, B. (1982) *Life in the Classroom and Playground.* London: Routledge and Kegan Paul.

This is an important book and several of the key ideas in this *set* item are discussed by Davies.

The idea that young children see friendship as meaning that they are playing together, and of 'interactive space' come from Corsaro, mentioned above.

The work by Adrienne Alton-Lee can be found in

Alton-Lee, A. (1984) *Understanding Learning and Teaching: An investigation of pupil experience and content in relation to immediate and long-term learning.* Unpublished doctoral dissertation, University of Canterbury.

and

Alton-Lee, A. (1983) Organising for Learning: the Results of an Ecological Study. *set* No. 2, 1983, Item 5.

There are three quotations in the section **Rituals**. The first is from William Corsaro, mentioned above. The second is from

Sluckin, A. (1987) The Culture of the Primary School Playground. In A. Pollard (ed.) *Children and their Primary Schools.* London: The Falmer Press.

The third is from Bronwyn Davies' book, mentioned above, page 63.

Another study of the implementation of BSM is

Bennie, N., Henry, E. and Ratcliff, B. (1990) *Beginning School Mathematics: A study of the Implementation.* Wellington: Ministry of Education.

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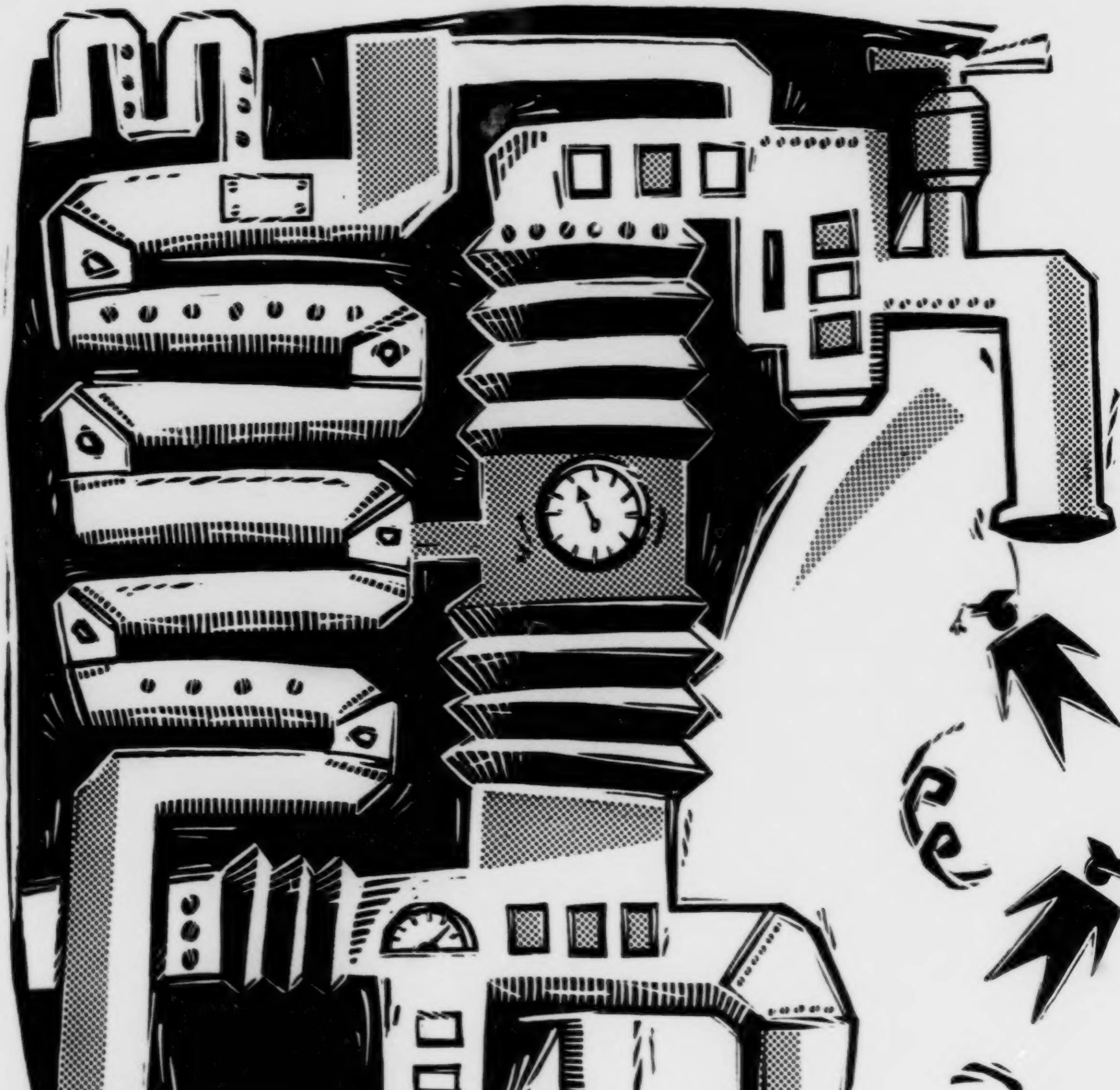
set research information for teachers
number two 1992

From College to...?

Asking New Zealand principals, 2 years on, about the new system of hiring beginning teachers

Marie Cameron, Lexie Grundnoff
Auckland College of Education



Nicola Belsham

New rules for old

In New Zealand the way beginning primary teachers find jobs in the 1990s is very different from how they found jobs in the 1980s. Prior to the education administration shake-up of 1989, beginning teachers in New Zealand were placed in schools by a regional board. Thus graduating from college meant that you were assured of becoming a beginning teacher.

Now the situation is dramatically different. As you leave your college of education you apply to whatever school you would like to teach in and the school's Board of Trustees, with the Principal, decides whether or not you get the job. In ***set*** No. 2, 1990, we wrote about what it was like in 1989, the first time under the new rules; what it was like for the graduates; what it was like for the principals.

Two Years On

In 1991 the rules remained the same but the job situation facing the graduates did not. Back in 1989 the graduates were appointed under the new rules, but the full impact of the changes was masked by the provision of 'over-entitlement' positions which absorbed graduates who did not win beginning teacher jobs. Furthermore, Ministry of Education changes in projecting 1992 staffing requirements meant that entitlements were, in many instances, reduced. This meant that the number of jobs advertised in the first round was substantially fewer than in 1989.

So in 1991 you had to sell yourself in competition with your friends (as in 1989) but on a very limited market. In our area there were four times as many graduates as there were positions advertised. So what is getting our first job like now? What is it like for the graduates? What is it like for the principals? How have things changed?

Our research

In the 1989 study we asked the 131 principals who had advertised beginning teacher positions in our area for their reactions to the new procedures. In 1991 we sent a similar questionnaire to the 39 principals who had advertised 'beginning teacher' or 'suitable for beginning teachers' positions in the official publication, the *Education Gazette*, between 1 October and 15 November. This is a comparable period to the earlier survey and so allows us to identify changes or trends. Because there were so few beginning teacher positions advertised, we also surveyed a sample of principals who had advertised basic Scale A jobs in the same period. A total of 95 questionnaires were distributed. Seventy percent of principals responded to our survey; a satisfactory response given the limited number of positions advertised this time. We also gathered some information on new appointments made from earlier and later advertisements. We interviewed 20 Auckland principals. Unlike the first study, this study did not survey student perceptions. This report, therefore, looks at the process from the point of view of the employers.

Positions available

In 1991, when our 317 graduating students opened the October 1 *Gazette* to look for their first job there were 13 beginning teacher positions in our region to choose from. In 1989 there had been 158. The next advertisements brought the total up to 45. There were also 114 basic Scale A positions which graduates could compete for along with experienced teachers (with only a slim chance of being selected, naturally).

Who was selected?

Most schools now appear to have selection committees which include the principal, staff representative, and Board of Trustees representatives. Panels frequently include the staff member who will have responsibility for the ongoing supervision of the beginning teacher. Involvement by the Boards of Trustees appears stronger than in 1989.

Because of the intense competition for jobs, schools were overwhelmed by applications.

Beginning teachers

Principals reported that an average of 43 women graduates from our College applied for each job, and 5 men. One school reported 100 women applying. A big change from 1989 was the large number of applicants from other colleges of education outside our region. For example, one school received 70 such applications.

Scale A positions

Graduating students were forced to compete for basic scale positions. There were fewer of these that they could apply for because many had 'tags' that the students couldn't meet (e.g., positions for teachers with Reading Recovery qualifications). However, popular schools still received large numbers of applicants: one school had 70 applications from our students. An average of 12 students from our College, and 8 from other colleges, applied for these basic grade positions.

The selection process

Few principals select new teachers on their own (fewer than 20 percent). Most schools have selection panels which shortlist and then interview only three or four applicants. However, six selection panels interviewed more than eight applicants.

As was the case in 1989, students generally supplied considerable documentation as a *curriculum vitae* (CV) in support of their applications. Principals are very impressed with the students' CVs. One principal commented: 'Generally student teachers' CVs were far more professional than those of first Deputy Principal, Senior Teacher, and Scale A's appointed this year.' Some felt they were too long and 'contain too much irrelevant information. I am not interested in information about babysitting and similar jobs.'

Principals made the point that students should be more selective about which jobs they apply for and not just apply for everything going. Students also need to address the job descriptions in the application form rather than send in a standardised CV and leave it to the selection panel to identify their specific strengths.

Principals continue to find the student profiles (the way the College writes up its assessments) helpful, but the issues of 'blandness', and lack of specific information limit their usefulness to prospective employers. As one principal reported, 'It is rather difficult to determine who is the best swimmer when all the applicants apparently walk on water.' Principals reported that they need to supplement reports with other judgements of student performance. Many rang up schools where students had had teaching practice. Several principals commented that colleges, after a course of three to four years, should be able to present more helpful documentation on students than they were managing at present.

What factors influenced final selection?

Principals rated the following factors as 'very important' when selecting their beginning teacher:

Commitment to teaching	(mentioned by 98 percent)
Quality of spoken English	(mentioned by 97 percent)
Overall appearance	(mentioned by 96 percent)
Overall personality	(mentioned by 96 percent)

These are very similar to those in the last survey. Principals look for beginning teachers who are committed to the job, who can handle administrative tasks efficiently, who speak and dress well, and who have developed interpersonal skills which allow them to fit into the culture of the school and the community.

Principals choose the person they consider best suited for the job, and they consider personal factors such as gender, ethnicity and age when there are candidates of equal worth. The following is a typical comment: 'The over-riding principle is the best person for the job, however, there are equity considerations for cultural background and gender, yes...in staff of 20 there is just 1 male in a classroom, so gender equity would have to be more men. Age is also a consideration: this school is skewing towards the older in the make-up of the permanent staff... I'd probably look for a younger person to balance up the older folk.'

So, how many got jobs?

By December 1991 approximately 15 percent of the graduating class of 317 had won positions. By February 1992 about 40 percent were in teaching positions.

Where are the jobs?

Most jobs were in Auckland (particularly South Auckland). Some, however, were in Northland and rather remote country schools. By the end of November at least 17 of our students had won basic Scale A positions. However, the 40 percent 'success rate' does not give the full picture. Many of the jobs are long-term-relieving or are on a term-by-term basis. Some beginning teachers are patching together a job from what they can pick up, like the woman who has combined two 'point four' (0.4) jobs into a 'point eight' (0.8), still not a full-time job. Four students (3 males) have moved to secondary school teaching.

Of the 60 percent who do not have 'proper' teaching jobs, some have returned to university to complete their degrees, and a large number are doing day-to-day relieving. This raises the question about on-going training and supervision for these people. Training and supervision-on-the-job for the first two years are requirements for certification and registration as teachers; how can these requirements be met?

Who got the jobs?

We cannot be too definite about the specific patterns. However, we can say that proportionally more men got jobs. Our most recent figures are that 113 females and 30 males have won jobs. Given that there were only 54 male graduates it appears that they were clearly advantaged in the appointment process. Men also tended to have full time permanent, rather than relieving, positions.

We wonder if there may be a trend to appoint young teachers, but because of the small numbers we cannot be sure. It is also not possible to make informed comment about ethnicity. The lack of a systematic system for accurate collection of employment figures is concerning. Because there is no centralised system we do not know enough about *who* is being employed, *who* misses out, and *what* they are doing when they do miss out.

Conclusion

The appointment of beginning teachers in 1991 was only the third time that New Zealand primary schools have had direct responsibility for appointing such staff. Using the Auckland experience, what has changed and what has remained the same?

From the principal's point of view, 1991 was an even more successful experience than 1989. This time 87 percent of principals appointed their first choice, (70 percent in 1989.) This is not perhaps surprising given the large number of applicants for the few jobs. However, comments indicated that they were pleased with the pool of applicants they had to choose from: 'The beginning teachers we interviewed were impressive.' And, 'A pity we couldn't employ the lot.'

The whole appointment process also appeared to be more successful. In 1991 there were not the comments about other, rival, principals 'jumping the gun' and 'not abiding by the rules' as there had been the first time round. From the principal's perspective at least, there seemed to be more awareness of using fair and equitable procedures, 'I'm really proud of our efforts to be fair but thorough...'

However, while the appointment process may be better, the conditions have changed so that the outlook for graduates is bleaker. What about the large numbers of 1991 graduates who are still applying for those (still scarce) positions? What about the ones who don't even get to first base in the appointment process? What's happening to them? As one principal stated, 'You've got to *feel* for the people who are applying – so many of them would do the job so well' and 'I feel so bad about saying no to heaps of applicants who would make very sound teachers.'

Implications

The implications from the 1991 survey may be summed up as follows:

1. Schools could decide which of their vacancies are specifically for beginning teachers. These could be advertised at any time during the year as it now appears likely that there will be unemployed graduates available.
2. Clear guidelines for the appointment of first year teachers could be published by the Ministry. For example, the following facts need to be well known: permanent positions no longer have to be provided, therefore beginning teachers can be employed for long-term-relieving positions; there is no longer a maximum number of pupils for beginning teachers; if a beginning teacher is appointed for a term (or less) they are entitled to 'point two' (0.2) time out of the classroom for induction training. If a beginning teacher is employed part time (0.5 up to 0.9) he or she is entitled to 'point one' (0.1) release time for induction and training. Guidelines may encourage more principals to employ first year teachers.
3. Consideration needs to be given to the induction training of beginning teachers who undertake day-to-day relief teaching until they win a full-time position. How does their relief teaching experience get counted towards their certification?
4. Applicants for beginning teacher jobs should be selective in what they apply for and in their applications should address the job descriptions carefully. The application process is a very expensive one, both in money and morale.
5. In light of the administrative changes since 1989, a system needs to be established to monitor the appointment process for beginning teachers. Currently it is

very difficult to ascertain what is happening 'out there' for our fledgling teachers.

6. There is no longer a specific agency with a brief to designate positions for beginning teachers. Responsibility now lies with principals and Boards of Trustees. Unless this responsibility to newcomers to the profession is shouldered by someone, the profession itself will become impoverished.

Notes

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This research, and further studies of beginning teachers will appear in a full research report available from the authors in late 1992.

The authors would like to thank the principals who participated in this research; Michael Cameron for data analysis and Heather Pinder, Principal Lecturer, ACE, for her helpful comments on this paper.

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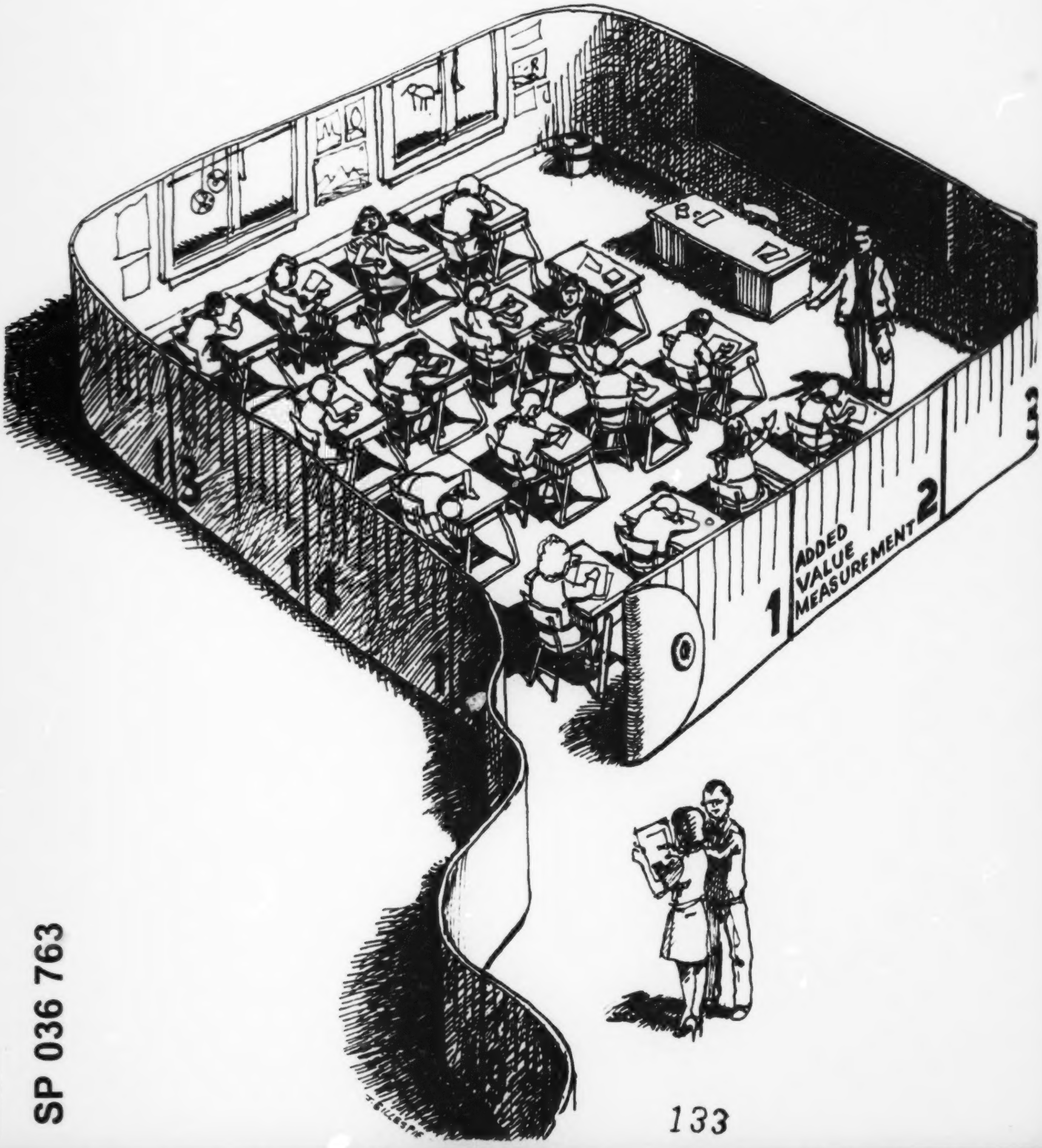

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RESEARCH
INFORMATION
FOR
TEACHERS

number one 1993

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set Editorial Advisory Board

SIX EDUCATIONAL RESEARCHERS, enthusiasts for getting useful research findings to teachers, have agreed to become an **Editorial Advisory Board** for *set*. All have written many articles in international academic journals; between them they have provided 21 items for *set* themselves, and all are expert in particular fields.

From Australia:

Professor Richard T. White

PROFESSOR WHITE taught in high schools in both New Zealand and Australia, and has been Professor of Education at Monash University, Melbourne since 1981. He is a Fellow of the Academy of the Social Sciences in Australia, co-founder of the Australasian Science Education Research Association and author of *Learning Science* (1988) and *Probing Understanding* (with R. F. Gunstone, 1992). In *set* he wrote the revealing 'What you taught and what they learned in Science' (No.1, 1982, Item 7) and the provocative 'The end of schools as we know them.' (No.1, 1984, Item 15.) He co-wrote the two parts of 'Increasing Meta-learning' in No.1 and No.2, 1990. Another *set* item is likely soon.

Dr Helga Rowe

DR ROWE is a Principal Fellow with the Australian Council for Educational Research. She has been on the staff of the Universities of Queensland, Melbourne, Hamburg, Manchester, and the Max Planck Institute in Germany. She is the author of several educational and psychological tests, and has published books on problem-solving, individual differences, information-processing and cognitive development. She is at present working on higher-order thinking in educational and real-world environments and on personal computers and learning. For *set* she wrote 'Problem solving strategies' (No.2, 1984, Item 13) and 'Teach thinking strategies' (No.1, 1989, Item 14).

Professor Sid Bourke

PROFESSOR BOURKE is Professor in Education at the University of Newcastle, NSW. Previously he was a Chief Research Officer with the Australian Council for Educational Research where he conducted national literacy, numeracy and oracy studies and an international study of classroom environments. His present interests are: the study of teaching practices, assessment of the effective outcomes of schooling; and research on research – particularly the development and application of quantitative methods. For *set* he wrote 'Community expectations of numeracy in schools' (No.1, 1981 Aus. edition, Item 3), 'Teaching primary mathematics' (No. 2, 1985 Aus. edition, Item 3), 'Classes of questions, questions of classes' (No.1, 1986 Aus. edition, Item 2), and 'Pupils talk in maths' (No.2, 1987, Item 14).

From New Zealand:

Dr Geraldine McDonald

DR MCDONALD has recently retired from the position of Assistant Director of the New Zealand Council for Educational Research. Her first career was as a teacher of homecraft subjects, her second as a mother of three, her third as a researcher of early childhood. In retirement she is continuing her recent research interest into those things we learn very early in our schooling, particularly those which underpin western civilisation – curiosity, logical thinking, problem solving, moral behaviour, a scientific attitude. Some of these we do not learn outside school, or learn poorly if we are not promoted to encounter them. Her first *set* item was 'Early childhood research in New Zealand' (No.1, 1975, Item 4). There were seven more before her latest 'Ten days in new-entrant classrooms' (No.2, 1991, Item 14, with Joanna Kidman). Another is promised soon.

Professor Ted Glynn

PROFESSOR GLYNN trained as a primary teacher in Auckland and completed his Ph.D. at the Ontario Institute for Studies in Education (OISE), University of Toronto. He returned to New Zealand and carried out research in the field of Applied Behaviour Analysis in Education whilst lecturing at the University of Auckland. His research has focused on areas such as residential childcare staff training, parent involvement in education, responsive social contexts for learning, parent and peer tutoring of literacy skills, and more recently, bi-cultural approaches to learning and conducting educational research. He is now Professor of Education at Otago University, Dunedin. His first items in *set* were an article on a research project and a small book that sprang from the research, 'Parents as remedial reading tutors' and 'Remedial reading at home', both with S. McNaughton, V. Robinson and M. Quinn (*set* No.2, 1979, reprinted in *Best of* **set**: *Reading*).

Graham Hingangaroa Smith

GRAHAM SMITH is a Senior Lecturer in Bicultural Education at the University of Auckland. He is also a Director of the Research Unit for Maori Education. He taught in primary, intermediate and secondary schools and has lectured at the Auckland College of Education. He worked to establish Kura Kaupapa Maori – schools where Maori is the medium of instruction – and has taught in one. His research and teaching interests are within the field of the sociology of education, with particular interests in critical theory approaches as they pertain to Kaupapa Maori initiatives, Maori schooling and educational policy development, intervention in Maori schooling and educational crises. He is of Ngati Apa (Wanganui) and Te Aitanga-a-Hauiti (Tolaga Bay) tribal backgrounds.

item 1

Research information for everyone interested in education: teachers, principals, students, lecturers, involved parents, board members ...

Leaflets and brief reports designed for a quick read, private study, staff-meetings, in-service courses, or small group discussions.

Produced twice-yearly by the Australia and New Zealand Councils for Educational Research.

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Andrew McPherson
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11. **Hopes and Fears of Students in Australian Schools**
Peter Dwyer
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12. **Examining Classroom Talk**
Michele Anstey
Since teachers talk a great deal, careful analysis of what teachers say is revealing. The talk of two teachers dealing with the same topic, is described here. More variety, suiting the words to the teaching point, and thinking the subject out better, seem to be required.

13. **Wielding Power in the Classroom**
Robert Tauber
There is bad power and good power, power that you resent and power you respect. The power a teacher can wield is examined and ways to create power that flows from admiration and regard are explained.

14. **Going Back to School as an Adult**
Barry Cocklin
A case study of adults back at ordinary schools shows how successful it can be. The small adaptations the school can make to enhance that success are noted.

15. **Students-at-risk**
Graham Bradley & Jacqualyn Stock
A co-educational state high school in Queensland developed a way of identifying and helping children-at-risk. This case study results in helpful advice.

item 2

set
number one 1993

EDUCATIONAL STRATEGIES FOR CHRONICALLY ILL STUDENTS

with a special section on Chronic Fatigue Syndrome

Dr Katherine Rowe Gwenneth Anderson
Patricia Fitzgerald Mary McLaughlin
Rhonda Higgins Tessa Brewin

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Kiri Gillespie

Chronic Fatigue Syndrome

THE CLINICAL PICTURE of a person who has Chronic Fatigue Syndrome (CFS) is of someone who, following a flu-like or glandular-fever-like illness (or some other viral infection) does not recover in the expected time. The excessive fatigue persists, and any minor activity causes aching muscles and arms and legs that feel like dead weights, as if the sufferer has run 5 km instead of just walking 20 metres.

Rest does not restore vitality but is unavoidable. Most troubling is the loss of ability to concentrate on tasks, to recall information quickly and to 'find the right word'. Severe persistent headaches, recurrent sore throats and enlarged lymph glands in the neck, low grade fever, abdominal pain, nausea and a feeling of unsteadiness are usually present. Pallor which persists and becomes more obvious when you try to be active is almost universal.

Rarely is depression a feature but when the illness persists for more than 6 months, feelings of frustration and being 'fed-up' are frequently present. Sleep disturbance, either difficulty falling asleep, excessive sleep or vivid dreams, are particularly disturbing for the young person and their family. Sufferers may not settle until 2 or 3 a.m. despite feeling exhausted and being in bed, then find they cannot wake at a reasonable time in the morning. Attending school is not possible, is in fact physically impossible, though many children with CFS are first thought to be 'school refusers'.

Chronic Fatigue Syndrome may be suspected but is not diagnosed unless the duration exceeds 6 months. This is an arbitrary figure which is well outside the normal period of time that one would expect for recovery from influenza, glandular fever, infectious hepatitis etc., all of which may have persistent symptoms for several months. Recent advances in blood testing can rule out glandular fever in many cases.

Is it a new disease?

Chronic Fatigue Syndrome has been known by many names, each of which reflects the geographic location of the outbreak or the prevailing theory of its cause. New Zealand's outbreak in the 1980s became known as Tapanui Flu after the town that suffered most. It has been described in the medical literature since the 1880's. Most cases were sporadic but outbreaks commonly occurred associated with polio epidemics between 1930 and 1955, in Iceland, Los Angeles and Adelaide. A well known epidemic affected almost 300 staff of the Royal Free Hospital in London in 1955, with 255 requiring hospital admission. This outbreak was known as the Royal Free Disease.

Myalgic Encephalomyelitis (ME) is the name used until recently, reflecting the observation that it is an illness associated with painful muscles (myalgia) and some Central Nervous System functioning, such as difficulty concentrating, retrieving information quickly and fatigue (encephalomyelitis). It has also been called 'Benign ME' meaning that it does not kill you, or 'Epidemic ME.' America has preferred the term Chronic EB Virus Infection. Post Viral Fatigue Syndrome, Post Infectious Fatigue Syndrome and Post Viral Syndrome are more names.

The name Chronic Fatigue Syndrome does not imply any particular cause and is universally accepted. However, it does provoke a superficial response – most people think they have experienced such fatigue!

Who gets it?

The majority of sufferers are in their forties, but the age range is from 8 to 60 years. An Australian study in 1990 found 40 cases per 100,000 persons with a few more women suffering than men. However, among children the ratio is three girls to each boy. Both rural and city children have been affected across all socioeconomic groups. The unfortunate term 'Yuppie flu' originating in the United States is probably because the well off sought help; it is not true that only yuppies get it. The average duration in adults is 3 years. Although many adolescents in our study have been ill for several years others have recovered completely and have remained well for the 2 years of follow up.

What can be done?

The cause of the illness is unknown, although current theories suggest that the body is failing to recognise that an original infection has been cured. There is no known treatment which will cure the illness, but many people pursue a wide variety of expensive treatments. Only one treatment has been carefully researched, and not found particularly useful. The lack of a 'magical cure' does not mean that nothing can be done. Sick students can be helped to survive in the best shape possible, until the illness gradually resolves.

Because the illness is chronic and the symptoms severe the student has, as well, major problems with educational, social, physical and emotional development. A multi-disciplinary approach is needed and the co-operation between physician and educational services is crucial if intractable problems associated with chronic illness are to be prevented. Students who are housebound, physically limited and socially isolated, miss education and, more importantly, have little exposure to normal adolescent experiences. A graduated return to school as the symptoms become less severe is ideal, but as this may not occur for many months, or even years, various strategies and resources are needed.

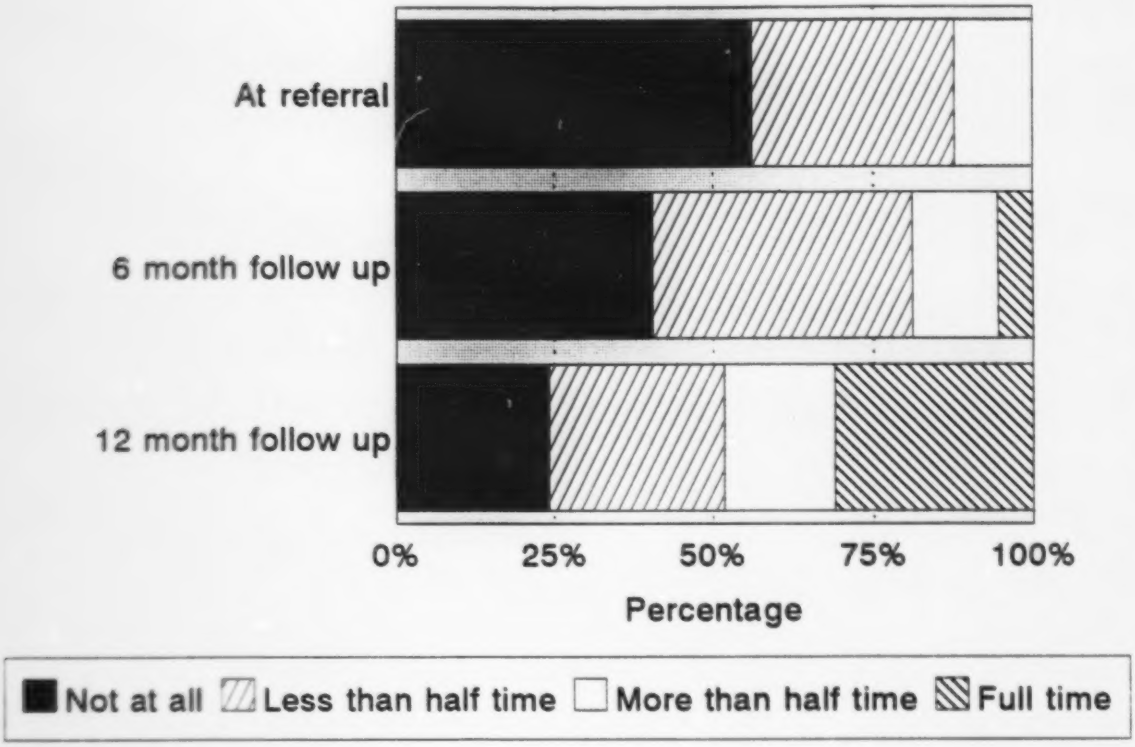
A graduated exercise programme should be begun. It should allow enough exercise to prevent muscle wasting while maintaining the maximum level of fitness possible. It must not exhaust the young person so much that recovery requires several days of bed rest. This may mean a walk to the letter box once or twice a day or a few minutes on the exercise bike, with the distance or time increased each week.

Many parents and schools were unaware of services that are available. Victoria, for example has Visiting Teachers and they have a Regional Team for Physically Disabled and Health Impaired Students. Such services facilitate contact with schools and help the return to school.

An example of how busy such a service can be is seen in figures for 3 years (February, 1989 to April, 1992). The Regional Team (Physically Disabled and Health Impaired) in the Eastern Metropolitan Region in Melbourne was asked to get Visiting Teacher support for 43 students with Chronic Fatigue Syndrome. The average age was 13.1 years and male to female ratio 1:3. The students were referred as suffering various complaints at first but as the years went by the medical professional became aware of CFS and recognised it.

Figure 1

Level of school attendance at time of referral, and later



Although progress towards recovery and getting back to school is slow, it is steady. This is clearly seen in the graph (Figure 1).

A great help is for everyone to assist the student maintain a network of understanding friends, either from school or from sporting or recreational clubs. Such a network facilitates the return to school and other activities. Emotional and psychological support is also important from friends and family, even more than from professionals. It is often needed to help the pupil cope with the frustration and loss that comes with the restriction of physical activities, social contact, and reduced academic achievement. Sufferers also have to put up with ignorance of the illness common enough in such unhelpful advice as 'just pull your socks up' and taunts suggesting they are malingering.

A partnership between health and educational professionals is crucial in limiting the potentially disastrous effects. Details of how this can be done are in the next section.

Educational Strategies for Chronically Ill Students

By the time additional educational assistance is sought for students who have a chronic illness, for example CFS, they usually have had considerable interruption to their schooling. Many who are confined to bed are getting no schooling. Without help students who are housebound become increasingly isolated from peers, school, and local community and have significant social and emotional needs which are not met.

Special Provision

In Victoria the special service, Visiting Teachers for Physically Disabled and Health Impaired Students, is provided by the Department of School Education. It is a good model. Visiting Teachers provide additional educational assistance, advice and support to students, their parents, schools and school communities. They are located at School Support Centres, call in other professionals where needed, visiting students at home or at school, as required. Working together with parents, schools and medical advisers, the Visiting Teacher ensures appropriate educational programmes at home and assists the process of returning to school.

Individual Programmes

A special physical exercise and educational programme is devised when the Regional Team finds out the severity of the condition and its impact on the student. Also looked at are daily routines, what class level and what subjects the student was busy at, and who is involved both at a medical and educational management level.

Students have many features in common when referred:

- delayed academic progress because of their illness;
- increased dependence on others;
- lack of confidence and reduced self image;
- decreased organizational skills;
- unwillingness to take risks;
- inability to make decisions;
- reduced social activity which leads to reduced social and interpersonal skills;
- high expectations for achievement in all activities; (many have been high achievers at school and/or in sporting activities or the arts prior to their illness).

The negative characteristics need to be gradually overcome in order to successfully re-integrate the student into the educational and social mainstream. The process of overcoming them can be likened to the peeling of an onion - layer by layer - usually with tears. However, with appropriate support and using a team approach, a reasonable level of success can be achieved.

Any chronic illness has an effect on the capabilities and behavioural patterns of the person affected and their families. The debilitating and unpredictable nature of Chronic Fatigue Syndrome is a good example. The combined effects of overwhelming fatigue, impaired concentration and information retrieval, together with headaches, muscle aches and pains and disturbed sleep patterns can present seemingly insurmountable obstacles.

Visiting teachers are important in this situation, otherwise it is only the medical side of the patient's well-being that is getting attention. Visiting teachers can bring objectivity, balance and continuity of support to the situation. By gaining a knowledge and understanding of the condition through their work with these students, and by liaising with them, their parents and medical advisers, visiting teachers are able to inform schools of each individual situation. An individual management programme which re-establishes and/or maintains the links between home and school, both academically and socially, can then be put in place. It needs to be flexible, have achievable outcomes, and encourage the student to acknowledge their illness and take responsibility for their own progress. It needs to provide informed options and encourage risk taking. Flexibility, patience, persistence and perseverance are all vital ingredients for maintaining such a programme.

The educational programme should be school based as much as possible in order to re-establish links between home and school and to facilitate the ultimate return to school. In cases when there have been long absences from school, students can be enrolled with the Correspondence School or the equivalent service or they may work on a modified programme combining correspondence school lessons with aspects of their own school programme.

Where visiting teacher programmes exist they have developed strategies for care-givers, for housebound students, for those returning to school and for maintaining the integration back into school life. They are not mutually exclusive and some overlapping does not matter.

Strategies

Strategies for the care-giver

- Acknowledge the illness and the limitations that it imposes on the ability of the student to undertake academic tasks.
- Work within the parameters set by the illness.
- Emphasize the need to 'get on with life'.
- It is crucial that the student have 'ownership' of the illness - they must be included in all decision-making that relates to their routine, e.g., most students with CFS can identify a time of day when their energy levels are higher and therefore they are able to cope with more activity. This identified period may conflict with family or school routines e.g., working from 1 a.m. to 3 a.m. This is not appropriate in most households or even hospitals so the body clock must be adjusted (using professional advice) to fit family/school routines.
- Establish a daily routine as soon as possible - balance time for rest, work and recreation. It is very easy for students to spend all their 'well' time doing homework or assignments at the expense of social/recreational activities.

Housebound students

Housebound students (referred to as 'homebound' in Victoria) are those who are unable to attend school for several weeks or even several months. The strategies for management of the educational programme for housebound students are dependent upon the needs of the individual and are therefore subject to negotiation.

Prolonged isolation from their peers often results in students losing the ability to relate and interact in social situations.

It is crucial that social contact of some description be re-established for the housebound student.

- Encourage the student to initiate contact, either by telephone or letter, with school friends or sporting/recreational groups.
- Emphasize that friendship is a 'two-way interaction' – this will usually involve considerable risk-taking on the part of the isolated student – the fear of rejection is often overwhelming and requires considerable support and encouragement to 'take the first step'.
- Actively develop risk-taking strategies for situations regardless of how minor they may seem.
- If a Peer Support Programme operates at school, encourage members to phone or visit on a regular basis.
- Allow the student 'private time' – students with chronic illness are often denied time without constant adult supervision. Normal adolescents require and demand private time.
- Primary care-givers should demonstrate that they are 'getting on with their lives' by maintaining social activities and/or work commitments, e.g., the weekly tennis game should continue if possible. Avoid giving up part-time employment. If the caregiver is in full-time employment some arrangements often need to be made regarding the care and support of the student during working hours.

Getting back to school – 'one step at a time'

- Establish one 'contact person' at school – encourage all information and negotiations to be relayed through this person. e.g., a Year Co-ordinator or a Student Welfare Co-ordinator, a Dean or Counsellor. The nominated person must be sensitive to the needs of the chronically ill student.
- Prior to returning to school, if well enough to attempt some school work, allow the student to make the decision about 'what', 'how much' and 'when'.
- If absence from school has been protracted, then introducing a programme of 'reading for purpose' is a starting point; break down the task – set achievable goals, for example, to read 10 pages per day and write 1 sentence about each chapter. A tape-recorder may be used if the student experiences difficulty with handwriting or concentration.
- If the student is being seen regularly at home by the visiting teacher, it can be negotiated (when the student is starting the road back to school) that the visit occur at school, for example, in the library, instead of at home. This can then be extended with the student staying at the school for a free period following the session with the visiting teacher. The next step is for the student to remain at school during a recess or lunchtime, to allow time for socialization. Gradually the time spent within the school environment can be extended until some social confidence has returned and the student is feeling comfortable in the school setting. (Using this strategy will depend on how confident the student is socially and emotionally. Some may not need such a very slow re-introduction.)
- The next step is to introduce the student to the classroom. For this to succeed, ask the student to list all subjects offered at the year (form) level in order of his or her priority. This will not necessarily be in order of academic importance as seen by teachers. Then choose a subject with which the student feels most comfortable; the teacher may be the reason for the choice. The student then attends just when the chosen subject is on.
- If the student feels capable of attempting more than one subject a realistic number should be negotiated, according to the stamina of the individual. These subjects then make up an individual programme. It is important for the student to understand that he or she must attend these classes unless the school is notified otherwise. Compulsory attendance is part of real life.
- Organising a timetable is crucial for a controlled return to school. First, the school expects attendance at the agreed times – a base for further progress. Second, it provides motivation for the student to make an effort to attend when the easier option may be to stay at home.
- A timetable helps to establish a daily and weekly routine. Success comes more easily if the student attends for specific *subjects* rather than for a predetermined *time* of the day. So, attending every morning regardless of which subject is on the timetable is less successful than attending, say, English and Physics. This system ensures continuity of subject content and gives the chance for socialization; other students quickly learn that the student attends all English classes but does not attend any music classes, for example.
- The student should be encouraged to remain at school during the recess and lunch breaks – most socializing occurs during these times. Friendship networks may have completely disintegrated during the absence period, therefore 'being seen' around the school is vital in re-establishing social links.
- Social skills may need revising, for example, how to participate in conversations, how to 'read' social situations, and how to handle negative comments from peers.
- When a chosen subject is not scheduled it is preferable that the student be given the choice of either remaining at school to rest, or of going home and returning when a subject is being taught. This choice, and an attendance register, must be negotiated with the school. Teachers should not be responsible for the transport of students to and from school.

At school – keeping going

If regular attendance has been established but the student is still absent sometimes, perhaps a couple of days or even a couple of weeks (perhaps for more treatment in hospital) the problem of 'catching up' occurs. The 'contact' person at the school should advise teachers of the absences and

ask about the possibility of 'catch-up' work, but not organise it. Manila folders (preferably of different colours) for each subject are useful so that the student, upon return to school, can approach teachers for work missed. This can then be completed at times that suit the student. It is the student's responsibility to manage this strategy.

Chronically ill students who have been absent from school for prolonged periods often lack initiative when they come up against 'difficult' situations. The situation may not be considered difficult by others, but it is nevertheless very real for the student. Sensitive handling is needed. The student will often appear to be coping with school in general, however 'panic syndrome' can overwhelm and jeopardize even the most carefully planned programme. Rehabilitating students may not cope well with any criticism (perceived or real), change to routine (with or without notice), and may be sensitive about instructions and/or comments from teachers or peers.

Encourage, or even insist upon, the use of a diary for social events as well as academic dates. Students with CFS, for example, are often reluctant to accept social invitations in advance because they do not know if they will be well enough on the day. Sometimes the social event itself will provide sufficient motivation for them to 'keeping going' rather than 'giving in' to the illness.

There is often a 'pay back' period following prolonged activity. Students may need to be reminded that fatigue and other symptoms, often requiring bed-rest, may persist for an unspecified period of time (ranging from a couple of days to a week or more). Students have to adjust their activities to cope with the energy level available and attempt to keep a balance between work, rest and recreation.

Allow the student to accept responsibility for their own problem solving. Ideas and options may be offered but the choice of the solution must belong to the student. Consequences of that choice must also be accepted by the student. For these strategies to succeed, the ideas and options need to be offered by a person with whom a trusting relationship has been established, for example, a visiting teacher or student welfare co-ordinator.

Normal adolescent behaviour must be taken into consideration. Mood swings, low-grade depression, anger, frustration, a need to be alone, even irrational behaviour can be part of the normal adolescent's quest for independence. In the chronically ill adolescent this 'normal' behaviour can be easily misinterpreted as part of, or as a result of, the illness. Chronic illness can accentuate normal adolescent behaviour.

As with any adolescent, goals and aspirations are important for the chronically ill student. The student with CFS or recovering from a chronic condition will often overestimate their ability to handle both the illness and the rigours of school work. Success hinges on a 'common sense management' plan for each individual student, taking into account their energy levels, their school work commitments and their recreational activities. Be realistic!

Flexibility is crucial. If plan number 1 doesn't work, regroup and formulate plan number 2. And so on! Management plans must be reviewed regularly.

Keeping going

- ❏ Encourage the student to plan ahead
- ❏ Encourage the use of a diary for social events as well as academic dates.
- ❏ There is often a 'pay back' period involved with social events. For example, if the ill student desperately wants to attend a particular rock concert they must realise that feeling unwell for an unspecified period of time afterwards will have to be endured. The pay back time could be as long as a week. The motto *Spend Energy Now – Pay Later* applies.
- ❏ Emphasize that educational opportunities are much broader now than in the past. There is greater educational flexibility now through
  - non-university tertiary education: TAFE in Australia, Technical Institutes in NZ.
  - part-time courses in almost every institution,
  - Community education,
  - VCE (Victorian Certificate of Education – Victoria only),
  - adult admission to secondary schools.
- ❏ Establish support groups
  - at school: usually the staff who are responsible for the student's programme;
  - amongst sufferers: there is one in Melbourne called STUFFED (Suffering Teenagers Unit to Fight Fatigue and End Depression);
  - among parents: such a group is the ME/CFS Society Parent Support Group.

Such groups do not need to be large, formal, with constitutions, incorporated, etc., but they are a great help to everyone involved. A grouping loosely attached to a particular hospital is often best, with parents all just a local telephone call away.

Notes

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Tessa Brewin is a Trial Co-ordinator, Chronic Fatigue Syndrome Study, Royal Children's Hospital, Parkville.

The Australian study of CFS which is quoted is

Lloyd, A.R., Hickie, I., Boughton, C.R., Spencer, O., Wakefield, D. (1990) Prevalence of chronic fatigue syndrome in an Australian population, *Med. J. Aust.*, Vol. 153, pp. 522-8.

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Measuring Added Value in Schools

Andrew McPherson

National Commission on Education (UK)

BRITISH SCHOOLS have been required to publish their public examination results for over a decade. The current Education (Schools) Bill says that the government's purpose is to 'assist parents in choosing schools for their children' and to 'increase public awareness of the quality of the education provided by the schools concerned and the educational standards achieved in those schools'.

Many people are affected by these requirements: parents, pupils and teachers; school governors, school boards and education authorities; indirectly the employers, colleges and universities who select school leavers, and central government itself.

But does such information enable us to say with reasonable assurance that one school is better than another, or better or worse than it used to be? How can the information be used, and not abused? And how can we ensure that it will meet the needs of the wide range of interested parties? The focus here is on test and examination results at the secondary stage, but the main arguments can be generalised to other stages of education, and other measurable outcomes.

1. **By themselves, examination results do not show a school's added value.** Test and examination results differ from one school to the next. This is undisputed, and is one of the main reasons given by government for its concern with standards.

But schools also differ from each other in their pupil intakes. This, too, is undisputed. The type of school influences the gender and denominational composition of the pupil intake. The location of the school influences the ethnic and social mix. Type and location both affect pupils' levels of attainment on entry, as do many other factors.

A school's 'added value' is the boost that it gives to a child's previous level of attainment. 'Raw' outcome scores do not measure this boost. Test and examination results provide misleading indicators of added value if they are not adjusted for differences between schools in the attainment of their pupils on entry.

2. **Nevertheless, unadjusted results are informative.** Raw outcome measures are informative because they reflect actual attainment and activity. They tell one, for example, that a particular syllabus is being studied to a certain standard. But they convey information only when properly presented. They should be based on entire year groups of pupils and should identify any special cases or exclusions from the year-group base, such as pupils with special educational needs and transferred pupils.

Information about attainment on a subject-by-subject basis is often useful. But when one is looking at an individual pupil's attainment, whether overall or in specified areas of the curriculum, separate subject scores have to be put together, aggregated, and this will entail value judgements. For example, it must be decided whether each grade level, or subject or type of examination, should be equally weighted or not.

A single outcome measure (a mark) may not serve all users equally well and may thereby give one set of users priority over another. For example, summary measures of attainment may be too general to meet class teachers' or parents' requirements to diagnose a child's problems. Similarly, judgements of value and priority are also implicit in the choice of a statistic to summarise outcomes: in the use of a mean or median, for example, rather than a distribution.

3. **Unadjusted outcome information should be accompanied by information on the school's contribution to pupil progress.** Parents need information on the value added by a school. School managers need information on the quality of the teaching input in a school. To meet such needs, one must take account both of the level of a pupil's 'prior attainment' before entry to the school or stage in question, and of other factors that might influence progress.

This cannot be done infallibly because there is no information available (at present) about methods schools use to boost attainment that can safely be assumed to apply to all schools in the future.

For example, studies typically find that about half of the variation among pupils in attainment in public examinations can be predicted from, or statistically 'explained' by, pupils' attainment on entry to secondary school. But such correlations do not necessarily tell us whether, and how, the pupils' prior attainment contributed to their later attainment.

If the cause lay solely with the pupil, then the school's boost, or added value, is the difference between the earlier and the later attainment. This is because the school was not responsible for the earlier level of attainment and its influence on later attainment.

On the other hand, the cause of the correlation between earlier and later attainment might lie partly with teachers. For example, teachers might wrongly expect from their pupils only levels of later attainment commensurate with their earlier attainment; and these teacher expectations might themselves then influence later attainment. If so, not all of a pupil's prior attainment should be subtracted when estimating a school's success in adding value.

The point is that the adjustment of outcome scores must always have a proper theoretical justification. Even the most 'commonsense' of adjustments is based on theory. Theories are not infallible, and therefore the particulars of any adjustment *may* be open to improvement and *must* be open to inspection and argument.

What is not open to argument, however, is that it should always be possible to adjust outcome scores for prior attainment. This is logically entailed in the idea of a pupil's 'progress'. Progress *is*, so to speak, an adjusted outcome score, the *difference* between an earlier and a later attainment. Schools are there to help pupils to make progress, so there can be no argument against the principle of adjustment if one wishes to know the added value of a school.

Nor can one dismiss the practice of adjusting outcome scores solely on the grounds that parents could never understand such adjustments. This would imply that parents could not understand the concept of pupil progress. Were this true, all attempts to inform parents would fail. A similar argument applies to adjustments for factors other than prior attainment, for example family background.

4. **Pupil progress is correlated with various non-teacher factors.** Pupil progress may be correlated with *factors within the school for which teachers are not responsible.* An example is given in section 8. The history and religious denomination, if any, of the school may be associated with pupil progress as well.

Also correlated with progress are the characteristics of a pupil's *household.* These include: household size and adult composition; the educational level of the parent or parents; and the parents' occupations. Other factors associated with progress include the level of material and social (dis)advantage in the immediate *neighbourhood* of the home, and aspects of the wider *opportunity structure*, including the level and character of local employment opportunities, and the opportunities for further progress in education and training.

5. **The assessment of the effects on pupil progress of schools and other agents should be based on an explicit theory of good standing.** There is substantial agreement amongst researchers, based on solid evidence, about a number of desirable features of any such theory. The first is that schooling is *longitudinal.* It takes place over time as pupils make progress and as schools maintain their effectiveness, improve or deteriorate. Any pupil can have a bad day, any school a bad year. Sensible judgements will therefore be based, not on snapshots, but on repeated measures of pupils and schools.

A second feature is that schooling is *multilevel:* pupils are grouped within classes, classes within schools, and schools within larger administrative and other types of grouping.

Both features are self-evident and should inform the way in which outcome scores are adjusted and used. Where they do not, adjusted scores will fail to inform the full range of users of the information; they may misinform them (see 7 and 8 below); and the statistical robustness of effects will be wrongly estimated.

A third requirement of a good theory is that it must be *multivariate* and *comprehensive* taking account of all factors involved. It is not sufficient to adjust outcome scores only for pupils' prior attainment. Outcome scores must be open to adjustment for other non-school factors that boost or retard progress.

The case for adjusting for non-school factors is not self-evident. But it cannot be dismissed by anyone who believes that a pupil's progress will benefit from the informed involvement of parents, or by anyone who believes that successful education is the product of a partnership between teachers and others. Adjustments are required if we are to avoid misinforming all parties to the partnership about the effectiveness of their several contributions.

6. **A single statistic may not be an adequate summary of a school's effect on pupil progress.** There are two reasons for this. The first is that theories are always capable of improvement. Different theories entail different adjustments to outcome scores. This is already argued in section 3 in relation to adjustments for prior attainment. A similar argument applies to other adjustments, for example for family background. Whether or not an adjustment for family background, or any other factor, is invidious, depends on the theory underlying the adjustment.

The second reason is that, even when the theory or account of schooling is agreed, different users of the information may reasonably require different adjustments to be made. Two illustrations are given, one in each of the following two sections.

7. **A school may boost the progress of different types of pupils at different rates.** One school may give a special boost to pupils who are already doing well or, alternatively, to pupils who previously have struggled. Another may succeed in spreading learning gains more evenly over all its pupils. A third may succeed in boosting the science attainments of girls in particular, whilst a fourth may give a particular boost to the language-related attainments of pupils from homes where the first language is not English.

All four schools could, nevertheless, achieve the same average attainment level and the same average amount of added value. In these cases, the averages would obscure as much about the school as they revealed. They would be of little help to a parent who wanted to make an informed choice for a particular son or daughter having a particular level of attainment and with a particular language capability.

In other words, a school may add different aspects and levels of value for different types of pupils. A method which can produce only one summary statistic for a school always runs the risk of misrepresenting that school's successes and failures and of misleading parents.

One advantage of a multilevel approach is that, subject to data availability, it allows one to test whether a single-statistic summary is adequate, or whether separate summaries are required for separate types of pupils. Multiple summaries may seem complex. But any complexity is simply a reflection of the respect that good statistics must have for the individuality of the pupils and schools involved.

8. **The interests of parents and the interests of teachers may dictate mutually conflicting but equally valid adjustments to outcome scores.** A pupil's attendance at a particular school may confer advantages which have little or nothing to do with the action of teachers. Some studies have found that the characteristics of the pupil body as a whole are correlated with individual pupils' progress. Such studies have shown that pupils of average prior attainment make more progress in a school where the prior attainment of all pupils was above average, than in a school where the prior attainment of all pupils was below average. Similar effects are sometimes observed for measures of family background.

Let us suppose that such correlations are wholly owing to peer-group effects outside the classroom: that is, to pupils learning from each other (or preventing each other from learning) in ways that a teacher could not reasonably be expected to influence. We would then want to discount that part of a pupil's progress from the assessment of the school's added value for the school.

Parents, by contrast, will be interested in **all** of the advantages that will accrue to their child by virtue of their attending the school, whether these advantages arise from classroom teaching, from peer-group effects, or from anything else (for example, the old school tie). It is not in parents' interest to discount peer-group effects when assessing the value of a school for their child. This gives us a second added-value statistic for the school.

Thus, a single-statistic summary cannot be presumed in advance to serve teachers and parents alike or, by extension, to serve education authorities and other interested parties. What is required is a multilevel capability. In this example the statistic needs to show (1) the pupils having certain individual characteristics, (2) the pupils as grouped within schools so as to have certain collective or 'school-level' characteristics.

Again, there is a seeming complexity. We need to have two estimates of added value for the one school. But the complexity is simply an honest reflection of the different interests of two of the parties to the partnership of schooling.

9. **Features of a good indicator system**. A good indicator system must allow for (1) the differences that characterise individual pupils and schools, (2) for different explanations of these differences, and (3) for the different interests of the range of parties to whom schools are accountable.

It is the job of statistics to produce the simplest and most economical summary of a school's value that is consistent with this variety and with the purpose or purposes of the indicator. The resultant summary might be simple or it might be complex. But complexity is not in itself an argument against aiming for the best possible indicator system.

Any attempt to improve schooling by means of informing choice presupposes that parents are capable of understanding at least the complexity of an adjusted outcome score. To reject that possibility is to reject the possibility of informing parents.

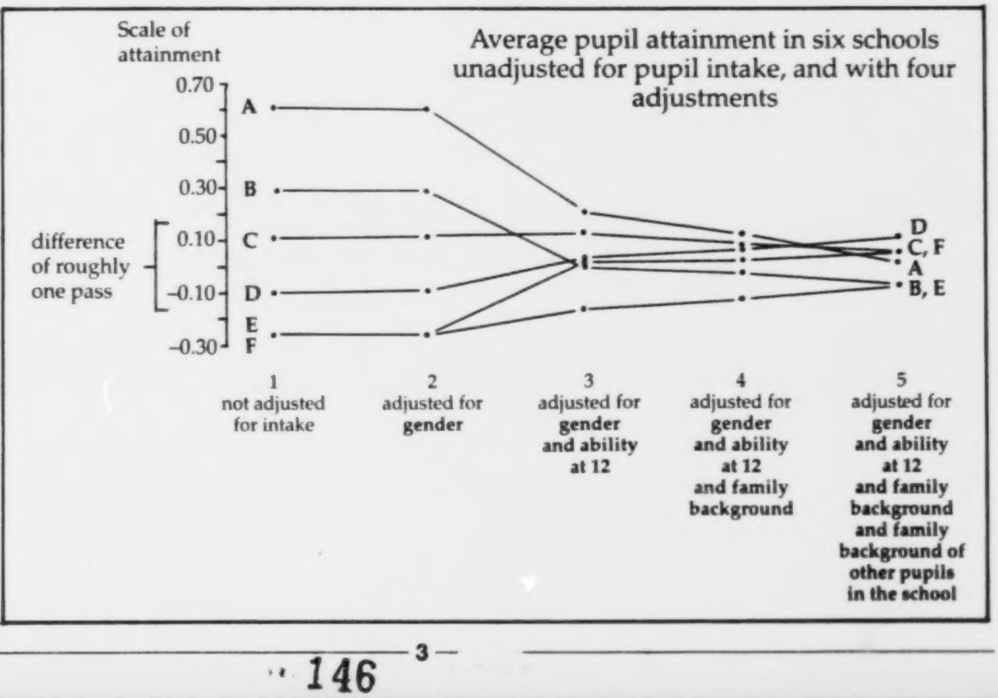
Nor is the cost of a good indicator system a decisive objection. We do not know the cost of the mistaken judgements, needless anxieties and fruitless 'further investigations' that are triggered by false signals from poor indicator systems. Misplaced complacency is costly too. In industry poor systems of quality control result in poor products and contribute to the very economic difficulties that better schools are expected to address.

A good indicator system will therefore aim to improve its own validity. It will not be content merely to indicate. It will endeavour to describe outcomes and processes directly, to be valid in itself.

Whilst it is unrealistic to expect to build a research enquiry into each and every application of an indicator system, the capability for testing its assumptions and improving its procedures should exist somewhere and should be available to everyone with an interest in better schooling. It will take quality to recognise quality.

Conclusions

1. Schools' test and examination results are informative **but 'raw' results are misleading indicators of the added value of a school if they are not also adjusted for intake differences.**
2. 'Raw' results should therefore be accompanied by **an assessment of the contribution a school makes to its pupils' progress.** The assessment should take account of each pupil's prior level of attainment and of other factors inside and outside of the school that may have influenced progress.
3. The basis of the assessment must be made clear, including any assumptions about the responsibility of teachers or others for the factors affecting progress; and **the assessment must have solid theoretical backing.**
4. **A single statistic may not adequately summarise progress.** Different types of pupils may progress at different rates. Parents and teachers may legitimately wish to know about different things. **What is needed is a good indicator system.**
5. A bad indicator system will hinder progress towards better schools and carry hidden costs.
6. A good indicator system will:
   - **take account of different needs and uses**
   - **be as simple as possible, while recognising the individuality of pupils, families and schools**
   - **prefer measures of stability and change in performance, to single 'snapshots'**
   - **have built into it the means of monitoring and improving its own validity.**



Average pupil attainment in six schools unadjusted for pupil intake, and with four adjustments

The chart shows the effects of four statistical adjustments for pupil intake on estimates of the quality of six secondary schools (schools A to F). The six schools are chosen from a part of Britain in which all schools are comprehensives. Showing more schools would clutter the illustration. Individual attainment is measured here by the number of passes in public examinations taken at sixteen, seventeen or eighteen years by pupils who were in their final compulsory year in 1983-84.

- With no adjustments for intake, schools E and F (coincident points) have the lowest average attainment scores, and school A the highest (column 1).
- Although females score higher than males on average, adjusting for the **gender** composition of the school does not change the estimates (column 2). This is because all of the authority's schools are co-educational and are more or less equally effective for males and females.
- Adjusting for **gender** and **measured** ability at the end of primary school does change the estimates, in two ways (column 3). First, it shrinks the range of differences between schools by about half. One reason for this is that ability on entry is correlated with later attainment. The other reason is that from school to school the difference between the pupils' measured ability on entry is greater than the progress the pupils made. Second, the rank order of the schools is changed. School B, for example, now lies very close to D and F. The close proximity of schools B, D and F in column 3 shows how misleading rank orders can be.
- Adjusting additionally for the **family background** of individual pupils (various measures of parental and household characteristics) further shrinks the differences between schools (column 4).
- Finally, in column 5, an adjustment is made for the **family-background characteristics of the school-leaver body as a whole** in each school. This adjustment shrinks the differences between schools yet further and results in further changes in rank order. This is because, in this particular example, the attainment of a pupil having a particular set of characteristics (of gender, verbal-reasoning ability and family background), is also influenced statistically by the family-background characteristics of other pupils in the school (see section 8).

One way of interpreting column 5 is to say that the teachers in the school with the highest added value (school D) boosted the attainment level of their pupils by roughly one examination pass more than in the schools with the lowest added value (schools B and E). Such a conclusion about a school's quality or the value it adds (and the conclusions that can be drawn similarly from columns 3 and 4) are very different from any that could be inferred from column 1.

Further information can be found in Lindsay Paterson's article from which this illustration is derived.

Lindsay Paterson, *Socio-economic status and educational attainment: a multi-dimensional and multi-level study*, Evaluation and Research in Education, Vol. 5, No. 3, 1991, pp. 97-121.

Notes

Andrew McPherson is Professor and Co-director of the Centre for Educational Sociology, Department of Sociology, The University of Edinburgh.

The Centre for Educational Sociology is a Research Centre of the Economic and Social Research Council which has supported many of the UK developments in school-effectiveness research on which this item draws.

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item 4

set
number one 1993

Practice 10, Theory 5

AN EXAMINATION OF THE DEPTH OF LEARNING

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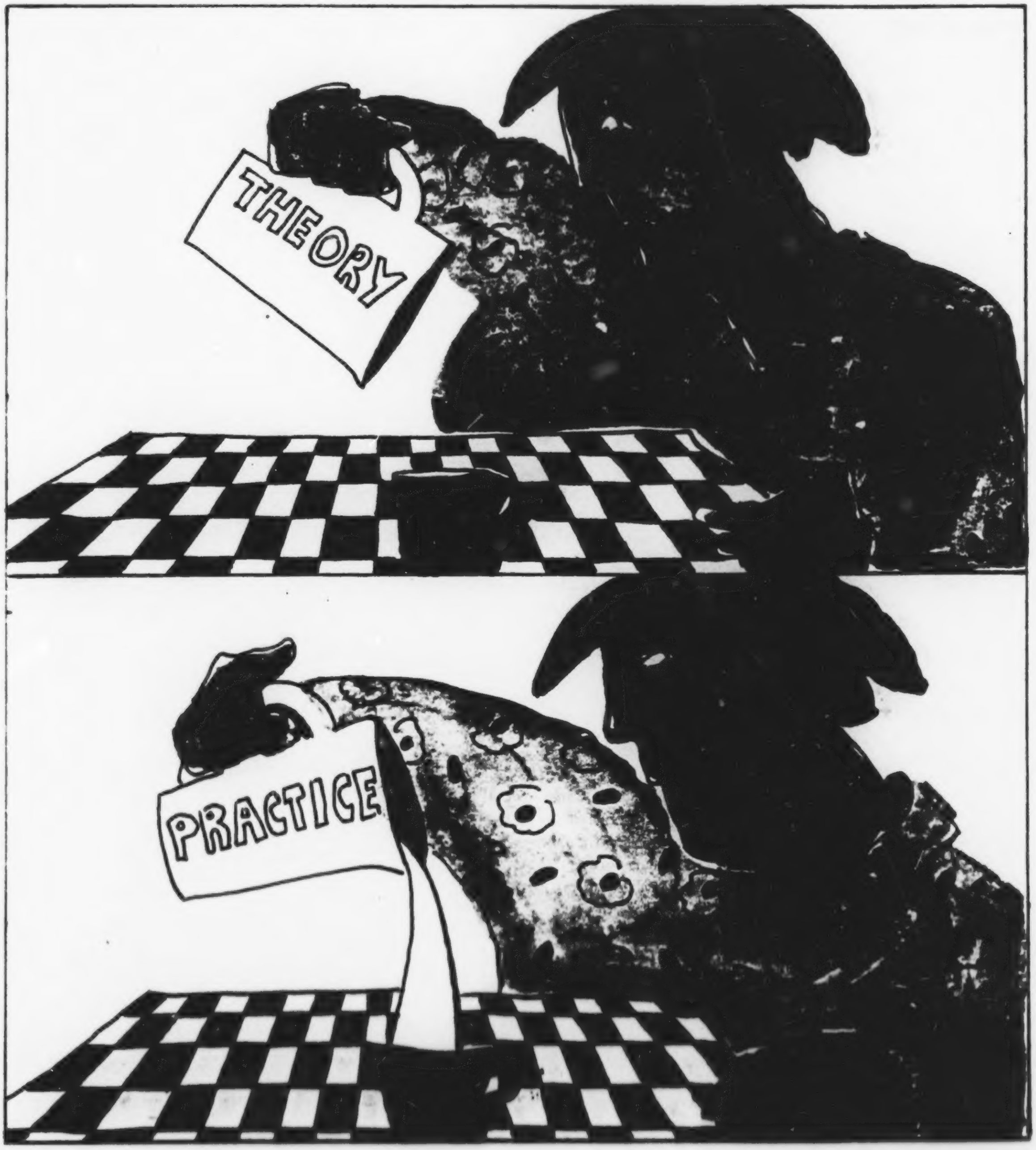

Shona McLean

Introduction

THIS EXAMINATION of teaching and learning in practical and theory classes took place in Australian colleges of Technical and Further Education (TAFE). New Zealanders have similar classes in their Polytechnics and Technical Institutes. However the conclusions should also be noted by teachers in secondary and primary schools who wonder where to put the emphasis between the practical and theoretical in order to achieve curriculum aims. This is especially so now that Australia has introduced Competency-Based Training (CBT), New Zealand has a new emphasis on 'outcomes', technology is becoming important in school curricula, and new qualifications are in the offing.

We were surprised to find in TAFE classes a dominant emphasis on information-giving to the whole class. This was rather than an emphasis on individual skill development. Naturally, we found major differences between theory and practical classes. And, in contrast to what you might expect, we found higher levels of thinking in **practical** rather than theoretical classes. Hence the title to this item.

The research

Our research set out to document the range of teaching and learning which occurred in 27 TAFE classes taken by 10 teachers, teaching 3 trade courses, and involving 127 prevocational and apprenticeship students. We used video, interviews and questionnaires. The data obtained from video-recordings accorded well with that obtained from teacher and student interviews. We looked at thousands of minute-long episodes and examined how students and teachers interacted, and the kinds of thinking which seemed to be occurring. One questionnaire measured the pressure which students felt to think at different levels and was found to be valid and reliable. The other questionnaire measured how students felt about the classroom environment, but was less useful than expected.

Pressure to think at different levels

The *Cognitive Holding Power Questionnaire* (CHPQ) was used to measure pressure to think at different levels. Cognitive Holding Power (CHP) is the power of the setting to press students into two kinds of thinking. These two kinds of thinking are called 1st order and 2nd order. 1st order thinking involves copying what the teacher does and doing what the teacher says. With 1st order thinking, students learn specific techniques to achieve predictable results. They do not think things out for themselves. With 2nd order thinking, students tackle problems themselves and ask for help only when needed. They recognise problems and attempt to solve them, themselves. 2nd order thinking develops conceptual understanding and the processes needed to solve new problems when facing change.

So 1st order CHP is pressure on students to engage in shallow thinking with rote learning of techniques. 2nd order CHP is pressure on students to confront the complexities of new situations and solve them as problems. Clearly, teachers need to engage in considerable planning to establish classes with high 2nd order CHP, which keep students interested, challenged and motivated. And teachers in these classes have to respond to students as they seek help in progressing through their problems, rather than direct the whole learning process.

General findings

Teaching actions

There was diversity in the teaching and learning actions under different teachers and in the classes of individual teachers. Nevertheless the most common teaching action for individual teachers was the presentation of information to the whole class.

This emphasis is of concern in technological instruction in times of rapid change. Preparation for a changing and increasingly technological work place requires that students develop both intellectual and manual skills and associated understanding. For this to happen, students need to learn in situations where

- they initiate their own learning activities
- they tackle realistic and complex problems
- they develop a deep conceptual understanding of these problems and the ability to solve related problems.

During early stages of learning, it is suitable for teachers (parents and caregivers included) to model new procedures and provide 'scaffolding'. However, teachers should then fade from the supportive role to encourage learners to engage in higher order learning themselves. Once the teacher has faded into the background, learners can try out their skills and problem-solving strategies, and check their strategies against their concepts. These types of learning help students to develop their own control over learning. Their understanding deepens with experience and continual monitoring, and they develop a structured set of problem-solving strategies and skills.

So, we think there is a case for reducing the emphasis on whole group work, teacher-centredness and information-giving in these classes. We would like to see more problem-finding and problem-solving by students, with the teacher acting more as a resource to support student thinking.

Cognitive holding power

Our study confirmed our ideas about how teachers can press students into different levels of thinking by creating cognitive holding power. In fact it was the teacher, rather than other factors which had most influence on CHP.

When the teacher initiates the action, students tend to engage in lower thinking. When there is a lot of presentation, again the students engage in lower thinking. This is also the case when the teacher deals with the whole class at once.

However, there is more press to engage in higher thinking when students initiate the action, or there is elicitation rather than presentation, or the teacher is dealing with one student, or the teacher uses a wider variety of techniques.

It is interesting that when the teacher imposes monitoring (rather than the students checking their own progress) this encourages lower thinking. This is probably because it is the teacher, rather than the students who is doing the higher thinking. On the other hand when monitoring is asked for or undertaken by students, there is more 2nd order CHP.

So, you can press students into using 2nd order procedures, by encouraging inquiry and active participation by students. This leads students to deeper conceptual understanding, greater control over their own learning and a stronger ability to adapt. However, when teachers dominate instruction, students just copy procedures and do as they are told. They do not actively make decisions, form judgements, monitor their own progress, revise their concepts or control their own learning.

New and experienced teachers

New teachers created classes with higher levels of personalisation, participation and investigation. However, experienced teachers produced more of 1st order CHP and 2nd order CHP than newer teachers.

Experienced teachers are probably more expert at producing whatever kind of learning environment they want. When they want students to watch and follow the teacher, they create 1st order CHP. When they want students to work things out for themselves, they create 2nd order CHP.

Apprentices and prevocational students

In these TAFE colleges, teachers pressed apprentices more than prevocational students into higher order thinking. Perhaps they felt that prevocational students, who come straight from school, need more direct teaching. This is a problem, because these students will develop less ability to solve problems and have more shallow understanding. As a result, they will be less able to adapt. With a growing trend in teaching vocational skills before students enter the workforce, this problem needs to be overcome.

Theory and practical classes

We found differences between theory and practical classes.

The distinctive features of **theory** classes are that they are teacher-centred, with whole class action focused on information from spoken words and texts, with *less emphasis on procedural and intellectual skills.* Almost two thirds of the time in theory classes is devoted to giving and receiving information.

The distinguishing features of **practical** classes were the greater diversity of activities, with action centred more on individuals and small groups of students working alone or with the teacher. Equipment and other concrete materials were used more to demonstrate practical skills or to furnish a backdrop for information about how to perform specific skills. *Practical settings are more likely to elicit 2nd order thinking; and there are more higher order skills evident in the monitoring of student results.*

Thus, some of the concerns about TAFE teaching and learning overall do not apply as fully to practical classes, where the actions accord more with those needed for the development of transferable and higher order skills. Nevertheless, we are most concerned at the high emphasis on information giving and the low incidence of genuine problem-solving in both theory and practical classes.

Another concern about practical classes is the low emphasis on the development of specific skills. Even in practical classes, only 18% of the time was devoted to the direct learning of specific skills. And 44% of time was devoted to information and information *about how to perform* skills, rather than to practising the skills. Similar conclusions can be drawn about problem-solving in practical classes. Less than 4% of time was used for higher order thinking in problem-solving, but more than 24% of time was used in monitoring student work.

How to create 1st Order CHP

Pressing students into following instructions or procedures, provided by the teacher, e.g. copying, doing as told, doing as shown, and relying on the teacher for ideas.

Teacher Activities

Demonstrating, telling, providing information, generating ideas, instructing, designing tasks for student practice, showing links, and checking results.

Student Activities

Copying the teacher, following instructions, relying on the teacher for new ideas and procedures, executing plans provided by the teacher, relying on the teacher for links and for checking on the results, passively accepting new information and procedures, and accepting results of activities.

Student Cognitive Activity

Internalising new propositions and learning new skills by imitation and practice.

How to create 2nd Order CHP

Pressing students into working things out for themselves, tackling problems, exploring, e.g. finding links, finding out information, checking results and trying out ideas:

Teacher Activities

Posing new problematic tasks, encouraging students to explore and tackle unfamiliar tasks and situations, providing information as requested, encouraging students to find links and check their own results against existing knowledge.

Student Activities

Interpreting new situations, making plans, solving new problems, making links between existing and new knowledge, generating ideas, trying out new ideas and procedures, checking the results of new procedures against existing knowledge, and monitoring own activities.

Student Cognitive Activities

Building on existing knowledge and skills to make plans for solving novel problems, to implement plans and to monitor progress toward goals. Using current understanding as the basis for interpreting problem situations and to-be-acquired skills. The active reconstruction and adaptation of propositions and skills.

Notes

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Mr Charlie McKavanagh is a lecturer in the School of Continuing Education and Technology, in the Faculty of Education at Griffith University, Nathan, Queensland, Australia, 4111.

This research was presented to the 1991 Conference of the Australian Association for Research in Education. The paper is called *Cognitive Structures Developed in TAFE Classes*, and is available from the authors.

The paper contains a great deal of the methodology of the research, the statistical methods used, the instruments – particularly the questionnaires and 17 tables. It is recommended to anyone studying learning of vocational skills and to anyone wishing to take the research further.

Subsequent related papers on the use of the CHPQ in school settings (John Stevenson) and improving teaching and learning TAFE classes (John Stevenson and Charlie McKavanagh) were presented at the combined Australian and New Zealand Associations for Research in Education conference held in Geelong, Australia in 1992, and are also available from the authors.

The concept of Cognitive Holding Power is fully explained in a paper *Conceptualisation and Measurement of Cognitive Holding Power*, presented by John Stevenson to the 1990 conference of the Australian Association for Research in Education, in Sydney, Australia.

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item 5

set
number one 1993

Gambling WITH MATHS

Robert Peard

Queensland University of Technology

I'll put my money on Representativeness....
I'll have ten on availability please

Shona McLean

Introduction

PERHAPS GAMBLING should be part of the *Health Syllabus*, along with the dangers of alcoholism and drugs. Australians spend $2000 a year for each working adult on legal betting – as a percentage of income, double the world average. New Zealanders are somewhat behind, spending $1400 per worker, about 5 percent of the average wage.

But in classrooms we do not study the social effects of gambling. We do not even study the mathematics of gambling. Perhaps we would save some of our pupils some money if we did.

As a part of a larger study I have been looking at both topics, the mathematics of probability and the children who gamble.

Misconceptions

There are many misconceptions about probability. It may turn out that those caught by the gambling bug are not aware of how big a gamble they are putting their money on.

The counter-intuitive result.

The well known 'birthday problem' is a good example.

> *What is the probability that in your class (30 people) at least two have the same birthday?*

Since there are 365 days in a year, we tend to think that the probability is low. Most people guess that there is less than a 50 percent chance of two having the same birthday. Yet simple probability theory, capable of being handled by 15- and 16-year-olds, shows that it is greater than 70 percent.

Since 30 is a reasonably common class size this is a useful problem for introducing the use of complementary probabilities in problem solving. Many texts contain an analysis of this problem; a good one is in *Mathematics, a Human Endeavour*, by H.R. Jacobs. For smaller groups try using birth month instead of birthday.

> *In a group of 'n' people what is the probability that at least two have a birthday in the same month?*

Maths teachers will know this as a useful problem to introduce the concept of a probability distribution by considering values of n = 2, 3, 4,...

Here is an example using a pack of cards that also runs counter to our intuition:

> *A shuffled deck is cut into three piles. Name any three cards. I will bet you that at least one of the cards on the top of each pile is one of the three you named.*

Many people will take this bet since the odds seem to be against me. Again simple analysis using complementary probabilities shows that the odds are slightly in my favour.

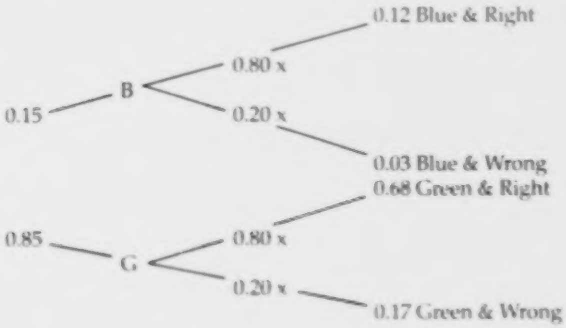
The base-rate fallacy.

This is illustrated by the following problem:

> *In a certain town there are two types of taxis: 15% are Blue cabs and 85% are Green Cabs. A taxi is involved in a hit-run accident. One witness says it was a Blue Cab. The court tests the witness' ability to distinguish between Blue and Green cabs under identical conditions and concludes that the witness is right 80% of the time.*
>
> *Question: What is the probability that the taxi was a Blue Cab?*

Lawyers, judges, doctors and even mathematics teachers agree that it is 80% likely that the taxi was a Blue Cab. Non-professional people put the probability even higher – they believe the witness, irrespective of other information.

By using a simple tree diagram, we see that there are four possible outcomes



The witness has identified the hit and run taxi as a Blue Cab, so there are two possibilities – it was blue and he was right (pr.=12/(17+12)=0.41) [41% likely], or it was green and he was wrong (pr.=17/(12+17)=0.59) [59% likely]. Therefore, it is actually more likely that it was a Green Cab!

• • •

I did not study these two misconceptions with children, but they are included here to show how serious the results of misconceptions about probability (and gambling involves decisions about probability) can be. There are several more examples in *Cognitive Strategies in Stochastic Thinking* by Roland Scholz of the misconception arising from the *base-rate fallacy*. He emphasises how serious the implications are. For example, doctors in making diagnoses must estimate the likelihood that symptoms are caused by certain conditions. Ignoring the 'base-rate' of the conditions reduces the likelihood of correct diagnosis.

Representativeness

> *If you toss a coin 10 times and 8 times it comes down heads, how likely is it that on the next toss it will come down tails?*

The gambler who thinks that tails is more likely believes in one of two fallacies – or perhaps in both. One is a base-rate fallacy, using the preceding short run as setting a representative base-rate. The other is the common argument that a long run of heads or tails is pretty unusual. This is called the 'gamblers' fallacy of the law of averages'. Just because a run is unusual doesn't mean that it is not going to happen right now. The chance of tails (or heads) is still 50%. The technical description of those who hold the gamblers fallacy of the law of averages is that 'they estimate the likelihood of an event on the basis of how similar the event is to be the population from which it is drawn.'

Availability

> *The odds of winning a particular game are 50:50. Out of the last 15 people to play, only 6 of the people won. Is the next person more likely to win or to lose, or are the chances equal?*

Some people make predictions about the likelihood of an event based on the ease with which instances of that event can be called to mind. This is a sort of nativity about probability. People say things like, 'I expect the next person to lose, because I know that people often lose at this type of game.'

Research in schools

I went to two suburbs of low socio-economic status where there is a high incidence of gambling and in two State High Schools I found twenty 16-year-olds in lower level *Maths in Society* classes. Most of them had had an introduction to basic probability in earlier years but none had done any formal study of probability nor encountered more complex topics such as *fairness* and *expectation* in class.

Using a short questionnaire I selected ten 'gamblers'. These were children who took part in games of chance involving cards and dice, were interested in horse racing or had families who were. Non-gamblers were those who did not take part in games of chance and were not interested in racing. With the help of the classroom teacher, I chose ten 'non-gamblers' whose success in mathematics was roughly comparable to the 'gamblers'.

Organisation of Data

The research involved observing the children and structured interviews. The results were qualitative data about

1. the fallacies of *representativeness* ('after tails 100 times its a million to one you'll get heads next');
2. *availability* ('people often loose on that type of game'); and
3. *expectation* ('the odds are 100 to one against that lame nag').

The interview questions included:

R1 In the last 200 Lotto draws the number 17 has occurred more times than any other number. In future draws, is this number:

- i. more likely to occur than any other number?
- ii. less likely to occur than any other number?
- iii. equally likely to occur as any other number?

R2 A roulette wheel has 18 red and 18 black numbers. The probability of the ball landing on a red is the same as landing on a black. A gambler observes the ball to land on the following numbers in a row of Six: RRRRRR. If he decides to bet on the next throw is it more likely to be:

i. red

ii. black

iii. no difference

A1 If I throw a single fair die, are the numbers one through six equally likely to occur?

A2 If I throw a pair of dice, it is harder to get a pair of sixes than it is get a pair of twos?

A3 A poker hand consists of five cards randomly dealt from the deck of 52. Ace is the highest card. Is it harder (i.e. less likely) to get 3 Aces than it is to get three fives?

A4 You and I play a game in which a coin is tossed. Heads, I win. Tails, you win. Of the last 15 people I played, only 5 won. Is the game fair? Do you think the coin is fair?

A5 If you could choose any one of the following lottery tickets, which would you prefer:

i. 123456

ii. 619999

iii. 615472

iv no preference

A6 If a family has four children, which of the following sequences is more likely:

i. BGBG

ii. GGGB

iii. both equally likely

E1 You and I play a game in which I roll a single die. If it is three or less you win, if it is more than three I win. If we each bet a dollar and the winner takes the two dollars, is this a fair game?

We change the rules so that you win if the number is less than three, I win if it is three or more:

i. who has the better chance of winning?

ii. if you put in one dollar, how much should I put in to make it a fair game if the winner takes all?

E2 Further questions on fairness and expectation depended on the pupils' response to E1.

Results

(1) *Representativeness* ('after tails 100 times its a million to one you'll get heads next')
Questions R1 and R2 were both answered correctly by 8 of the gamblers. The 2 incorrect both used representativeness consistently in both questions replying '17 seems to be a lucky number' and 'the roulette wheel favours the red'. Of the non-gamblers 5 answered both questions correctly; 4 used the gamblers fallacy consistently to conclude that '17 was now less likely and the black now more likely'. One was not sure of either question but concluded 'it probably didn't make any difference'.

(2) *Availability* ('People often loose on that type of game')
Availability was rarely used by the gamblers. None used it in questions A1 to A3, some replying that the questions were 'a bit silly', the answers being so 'obvious'. Two used availability in reasoning that the coin in A4 was not fair. Two used availability in A5 reasoning '... you don't often see numbers ending in four nines winning'. Most misinterpreted A6 to mean 'two boys and two girls are more likely than three girls and a boy' but when it was explained that the question referred to the *sequence*, only one chose incorrectly.

Although non-gamblers used availability more than the gamblers, the incidence of its use was not great, as illustrated in the summary below.

Incorrect Responses using *availability.*

Question	Gamblers	Non-gamblers
R1	2	5
R2	2	5
A1	none	2
A2	none	2
A3	none	2
A4	2	4
A5	2	4
A6	2	4

Expectation and Fairness

Expectation is the reason why some bets are made in the form 'I'll bet you my Rolls Royce to your Mini-minor', and the wins in Lotto are so high. Quite often the odds are not even (as they are in coin tossing) but depend on expectations of performance or other factors intervening. No one would give even odds (in 1993) on Sydney getting the next Olympic Games. The odds are 'fair' when they reflect true expectations.

Non-gamblers with no experience in betting and no schooling in probability had difficulty defining *fairness*. Most thought 'fairness' implied an equal probability for players and that a game in which one player is more likely to win could not be fair. None could use the concept of *expectation* to determine fairness. This also applied to 6 of the gamblers. The other 4 had constructed their own essentially correct understanding that the product of probability and amount can result in a fair game. An example:

Subject: Leona, Year 11 (Form 6).

Low achievement in current maths, poor history of achievement, expressed dislike of the subject. Plays various dice games regularly for fun, cards regularly for fun but sometimes for small stakes, but says that the stakes are not important. Parents bet regularly on horse racing. Brother is a jockey. She follows the wins and losses but does not herself bet on the track.

Leona showed no use of *availability* nor *representativeness* and thought the questions so obvious as to be trivial. She recognised in Question E1 (ii) that the opponent should put in more money to make the game fair. With prompting she concluded that her chance of winning was 1/3 to the opponents 2/3 and so she should receive twice as much in return. Subsequent interview questions showed that she had a clear understanding of expectation. She recognised who has the greater expectation in various situations, without referring to it as such.

It is interesting to note that she does not want to play, even when her expectation is greater than her opponents, if the probability of winning is low, or if the amount lost is high. Some adult gamblers who are part of the larger study, exhibit these same characteristics in betting on horse races, preferring to bet at 'short odds' and avoid 'long odds' unless they believe the chances of winning are substantially higher than the odds indicate (i.e. they have other information).

Further research into the cognitive processes employed here is proceeding.

Conclusions

It appears that the mistakes about probability called *availability* ('People often lose on that type of game.') and *representativeness* (the gamblers' fallacy) are not as common as it has been suggested. Young gamblers are not often going to waste their money on stupid bets even though they do not understand the language of probability as Mathematicians do. It is true that my sample size was small. However, it would appear that those who play games of chance involving cards and dice, and have some knowledge of gambling, do not fall into those two traps. Those who do not gamble are more naive.

Misconceptions regarding *fairness* are common. Non-gamblers have little grasp of these concepts. Some gamblers have constructed a concept of expectation that is essentially equivalent to the mathematical concept and use this concept in decision making.

It would do no harm to check that your pupils, before they leave school, can handle the concepts of *representativeness* and *availability* and it would seem quite important to give them a grasp of *fairness* and *expectation*. I did not examine *contra-intuitive* results, nor *base-rate* fallacies. For those students going on to try for the professions a course on *base-rates* would at least give them pause to think carefully later, and seek expert advice, when confronted with difficult decisions hanging on probabilities.

Notes

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The material in this **set** *item* is found in a fuller version in

Peard, R.F. (1991) *Technical Report No.3, Misconceptions in Probability: A Comparison of Gamblers and Non-Gamblers within the Australian Social Context*, Brisbane: Centre for Mathematics and Science Education, Queensland University of Technology.

Other parts of the larger research project, of which this item describes a part, have also been described in

Peard, R. (1990) *Gambling and Ethnomathematics in Australia*. Proceedings PME 14, Mexico, pp. 335-342.

and

Peard, R. (1990) *Probabilistic Concepts in School Mathematics*. The Australian Mathematics Teacher, Vol. 46, No. 2, pp. 14-16.

The figures on Australians' spending on gambling can be found, with much more, in

Haig, B., in Caldwell, G. (1985) *Gambling in Australia*. Sydney: Croom-Helm.

The New Zealand figures are deduced from

Department of Statistics (1992) *The Official Government 1992 Year Book*, Wellington: GP Print.

The birthday problem is discussed in the text recommended, which is

Jacobs, H.R. (1976) *Mathematics, A Human Endeavour*. Lloyd O'Neil: Sydney.

The work on the Blue Cab/Green Cab problem and the serious misconceptions the base-rate fallacy gives rise to can be found in

Scholz, R.W. (1987) *Cognitive Strategies in Stochastic Thinking*, D. Reidel.

The misconceptions of representativeness and availability are described and discussed in

Shaughnessy, J.M. (1981) Misconceptions of Probability, *Teaching Statistics and Probability*, NCTM 1981 Yearbook.

and

Shaughnessy, J.M. (1981) Misconceptions of probability: From systematic errors to systematic experiments and decisions. In A.P. Shulte (Ed.) *Teaching Statistics and Probability*, Reston, Va: National Council of Teachers of Mathematics, pp. 99-100.

The description, 'the gamblers' fallacy of the law of averages' comes from

del Mas, R.C. and Bart, W.M. (1989) The Role of an Evaluation Exercise in the Resolution of Misconceptions of Probability, *Focus on Learning Problems in Mathematics*, Vol. 11, No. 3, pp. 39-53.

It was suggested in

Kapadia, R. (1984) *Probability – The Subjective Approach*: Mathematics Teaching, September, pp. 46-49.

that in Shaughnessy's research 'the misconception may actually refer to a misinterpretation of the question.' To avoid this I employed the stuctured clinical interview as described in

Romberg, T. and Uprichard, A.E. (1977) The Nature of the clinical investigation. In *Clinical Investigation in Mathematics Education*, Research Council for Diagnostic and Prescriptive Mathematics, pp. 1-14.

Pupils difficulties with the independence of events, myths about the difficulty of throwing a six, and other problems of probability are discussed in

Anderson, P., Kempster, G. and Pegg, J. (1985) *The Chances Are ....* Australian Association of Mathematics Teachers.

and

Anderson, P. and Pegg, J. (1988) Informal Probability – An Investigative Teaching Approach. Mathematical Interfaces. *The Proceedings of the 12th Biennial Conference of the Australian Association of Mathematics Teachers*, Newcastle, pp. 92-95.

The areas of greatest difficulty in understanding probability (and misconceptions about it) exist at all levels of school. This was discovered in a review of the research:

Garfield, J. and Ahlgran, A. (1988) *Difficulties in learning basic concepts in Probability and Statistics: Implications for Research*, Journal of Research in Mathematics Education, Vol. 19, No. 1, pp. 44-59.

In the Fourth NAEP maths assessment it was shown that only 5 percent of Year 11 (Form 6) students correctly answered questions involving compound probability and most experienced difficulty with all items all but the simplest concepts of probability. See

Brown, C. et al. (1988) *Secondary School Results for the Fourth NAEP Maths Assessment*. The Mathematics Teacher, Vol. 81, No. 4, pp. 241-248.

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item 6

set
number one 1993

A Matter of Survival

STRESS AND THE EMERGENCY TEACHER

Evelyn Bransgrove and Athena Jesson

Deakin University

TRICK OR TREAT
limbo
limbo

Nicola Belsham

> **As a recent graduate with no appointment to a school I face the prospect of joining the ranks of Emergency Teachers while I wait for a job. Will the educational philosophy I have just developed be practical? Will it fit ET teaching? Will I be hanging in limbo somewhere, waiting for a 'real' job where I can do some 'real' teaching?**
>
> **Athena Jesson**

Introduction

CAN RESEARCH help new teachers who are in that bind? Research can help ETs cope, mainly by showing them how universal their problems are. This *set* item aims to help ETs (also known as relief teachers, supply teachers and TRTs). However, policy-makers, teacher unions, teacher educators and regular classroom teachers should also take note.

The main research technique was a questionnaire. We aimed to find out (1) how young ETs were coping, (2) how they felt their training had helped (or hindered) their ET teaching; (3) how their philosophy of teaching had been confirmed or compromised in ET teaching, (4) what advice they would give others.

Teachers, young and old, experienced and inexperienced, will find much which 'rings true' in the ET's answers, from their own experience. There are common problems and difficulties worth sharing, and not-so-com-

The Questionnaire

In Section A subjects were asked to rate the following statements by giving a true/false response.

1. Children must always be reprimanded if they are wasting time and not concentrating on the task at hand.
2. Each child needs control over their own use of time so they may learn at their own pace.
3. Maths concepts can best be taught through teacher directed activities to be sure they are properly understood.
4. Children should:
   a) make their own classroom rules.
   b) decide their own discipline measures.
   c) negotiate amongst themselves where classroom furniture should be placed.
   d) plan their own curriculum.
5. It is important to keep a classroom quiet so children are able to concentrate on their work.
6. If children had a choice they would never do any maths.
7. Teachers should never let children know if they don't know the answer to a question.
8. A set curriculum should be abandoned in favour of allowing children to pursue their own interests.
9. A child must always know the teacher is in control of the classroom.
10. The use of worksheets should be greatly reduced in the average classroom.
11. It is more important to focus curriculum on what the children's interests are than what society expects and needs them to learn.
12. There is no place in the modern classroom for grammar instruction.

Responses were interpreted as either 'conservative' or 'progressive'. Totals were then converted to percentages.

In Section B subjects were asked to respond to the following questions by circling a response.

(i) Do you believe you make the most contribution to:
  a) a child's social skills.
  b) his/her academic skills.
  c) his/her independent learning skills.

(ii) You have trouble reconciling your personal educational philosophy with what you practise in the classroom:
  a) never.
  b) rarely.
  c) sometimes.
  d) often.
  e) all the time.

(iii) Assuming you are aware of the rules of the regular classroom teacher, would you consider them as:
  a) important to support in the name of consistency even though you may personally disagree.
  b) the views of only one person. You are entitled to set your own rules as a professional in your own right.
  c) necessary to observe so you don't ruffle the feathers of the classroom teacher and affect the possibility of getting any further work in the school.

(iv) The majority of the lessons you prepare are:
  a) whole class activities.
  b) small group activities.
  c) individual worksheet activities.
  d) you try not to structure the day so that the children can work on anything they have outstanding.

mon enrichments too. Mr and Ms ET, you are not uniquely cast down by feelings of incompetence! All other ET's see it mostly as *A Matter of Survival*, too. And some have help for you.

Method

Our study was particularly concerned with the difficulty ETs find reconciling their own personal philosophies with what they actually have to do in classrooms.

Statistical conclusions should not be drawn from this survey: the sample is small, much data remains to be gathered and the accuracy of some responses can be questioned. However, our study highlights the fact that emergency teaching is not simple. For instance one of the ETs we questioned said of the survey:

> I had difficulty in being black or white because *much* depends on circumstances, and... my role regularly changes depending on the needs of the individuals I am teaching.

Answers were limited to True/False in order to draw general conclusions. Finding respondents was a difficult task since Ministry of Education files on ETs are confidential. Therefore we contacted 40 postgraduates-students on campus at Victoria College who were also emergency teaching.

The sample is largely of teachers who were busy extending their qualifications and in most cases this meant that their experience with emergency teaching was limited. In fact few could be considered as very experienced in emergency teaching. Clearly there is another group of more experienced ETs which are not represented in this sample such as mature aged women returning to teaching after a break in service.

Discussion

In our opinion, statement 4, which established the extent to which the teachers were prepared to offer children democracy in the classroom, was the clearest indication of the beliefs of these Emergency Teachers.

Twenty-five percent of this sample rated themselves in highly progressive terms and more than 50% exhibited progressive inclinations. To what extent did these teachers have difficulty in reconciling their stated philosophy with their practice in Emergency Teaching?

Section B clarifies the picture of emergency teaching further. For example, the 25% who thought of themselves as very progressive said that although they wanted to facilitate children's social and independent learning skills they felt limited to contributing to the children's academic skill development only.

However, in responses to question (ii), only 10% considered that they offen felt difficulty reconciling their philosophy with the experience of emergency teaching. Being forced to restrict their teaching to academic coaching now and again did not alter basic philosophies.

The most progressive teachers neither viewed their role as that of 'babysitter' nor felt that the lessons that they prepared fell into the 'busy bag of tricks' category. At the same time they did indicate that their main consideration was to provide educational activities for the children. The conclusion that can be drawn is that they seem to have had far higher expectations of themselves as Emergency Teachers than did most of the other respondents.

ETs who were progressive and experienced were more satisfied with their working conditions. Less well experienced progressive ETs were concerned with discipline problems.

What was probably the most revealing set of results came from Question (iv) which asked the ETs to note the degree to which lessons were individualised. The more experienced teachers said they employed small group and individual activities the majority of the time. Without exception, less experienced ETs said the majority of their classes were whole group activities. New ETs do not venture beyond secure, easily controlled activities. Whole group activities tend to be, by their nature, teacher-centred and as such are not usually among the progressive principles of child-centred learning.

Conclusions from the Research

One fact was agreed by all: the ET must maintain control of the classroom. The advice of an experienced Emergency Teacher not in the research supports that:

> ...make decisions firmly to the best of your ability, and stick to them. Behaving decisively is the surest way to maintain a position of authority.
>
> Pronin, p.97

Thus the 'progressive' teacher who would normally choose to share the control with the children has a problem: a conflict between personal philosophy and being required to display authority. The desire to create a particular learning environment was usually sacrificed for the sake of maintaining that control. No doubt this creates a sense of frustration for these ETs who are desperate to offer quality learning and teaching and yet feel unable to do so.

Most of our ETs indicated that the focus of activities that they actually use differs from the focus they would choose in their own classroom. Several said they would like to focus on developing social skills, but actually found themselves teaching academic skills more often.

Several ETs were very concerned about discipline. However, with experience, the study showed, the focus grows beyond simply maintaining control. Then, learning experiences provided by the emergency teacher can become just as important educationally as the children's 'normal' day. All the more experienced ETs said activities must be educational: the inexperienced did not mention this.

A major influence on the practice of the Emergency Teacher was the expectation of the classroom teacher. Another influence was the general policies of the school. Most agreed that it was important to support the rules of the regular classroom teacher in the name of consistency. However, it appeared that the ET's style of teaching varied little. There was a quick evaluation of the particular class, and the framework established by the school and regular teacher, but the ET made few changes to his or her style.

The regular classroom teacher has the obvious advantage of time to develop a routine and philosophy to which the children become accustomed. Perhaps Emergency Teachers must win the co-operation of their classroom by specific and unique strategies. One of the ETs we questioned hinted at an attitude of humanity saying: 'Usually I try to treat them like adults'. Children appreciate Emergency Teachers sharing themselves. A writer on emergency teaching said:

> If I have been successful as a sub [substitute teacher], this is certainly one of the reasons for it.
>
> Pronin, p.76

Job satisfaction for the progressive emergency teacher is possible although Finnis and Williams found that the majority of ETs are not professionally satisfied. They describe 'the sense of alienation, powerlessness and professional dislocation' (p. 13) which, however, is balanced with resilience, determination and optimism. Those things that make emergency teaching stressful have been highlighted, but all of these ETs, irrespective of their peculiar teaching philosophies, stated that they enjoyed emergency teaching; obviously despite the stress and unsettled feelings. One ET said:

> Emergency teaching on a day to day basis can be extremely frustrating.... You go against all your own principles and philosophies most of the time in order to maintain consistency in the classroom, hence you are someone you're not.

Comments from Research Literature

Emergency teaching is nowadays both a means of improving a graduate's chances of being offered a permanent position and a way beginning teachers can satisfy their career ambitions.

> ET employment 'is an increasingly significant and more permanent aspect of education. To continue disregarding its particular... challenges would be professionally irresponsible if not wilfully negligent'.
>
> Finnis and Williams, p.3

Thus it is somewhat alarming that formal pre-teacher training has not been brought up-to-date to build on the growing informal knowledge so that beginning teachers have the skills to deal with emergency teaching. The majority of ETs surveyed by Finnis and Williams declared teacher training as irrelevant to the conditions of ET employment. In addition they reported an overwhelming lack of assistance provided by both schools and employing authorities.

The emergency teacher is faced with quite a different role and needs different expertise from the 'regular' classroom teacher. Motivation and discipline are the first differences the most demanding form of teaching appears to be left to the least experienced. Barbara Pronin says that guiding the class through the academic activities of the day will be the easiest part. Some pupils think that having an ET is the sign for a 'day off'.

> Emergency Teachers don't have as much control because 'they don't know us' or 'they don't know us that well' so 'we have fun.'... If they aren't strict the kids tend to play up. Also they don't do their work – like, if they get away with one thing they will try something worse and more daring.
>
> Wood and Knight, p.37

> Moreover, the student who leans towards 'problem behaviour' '...is precisely [the] type of child who finds it most difficult to accept a substitute teacher or any change in his [her] routine.'
>
> Pronin, p.44

ETs, restricted by time, do not have the opportunity to create a healthy, supportive learning environment; nor the chance to build personal relationships with each child; both contribute to minimising attention-seeking or other disruptive behaviour. ETs come into a classroom with little or no knowledge of the group dynamics, of the personalities, of the needs, of the problems of each child.

> Unless their relationships are good teachers will find that even outstanding teaching techniques are useless.
>
> Gordon, p.24

There is a big difference for the ET between a day that the absent teacher has prepared for, with on-going learning experiences planned, and a day on which there is nothing for the ET to latch onto. This was reinforced by ETs surveyed in South Australia who said that while they expected absenting teachers to leave outlines of work, in reality often this did not occur. Some ETs are advised to put work up on the blackboard to keep the class busy for up to two hours whilst they prepare for the rest of the day. If the work bears no relation to the children's normal work and is just 'busy' work there is little satisfaction, and the teacher is indeed just a 'babysitter'. Just as bad is the attitude of the rest of the staff who will unconsciously prepare the children to be disruptive and disobedient, if they expect just that, every time a class is 'babysat'.

Reduced to their most fundamental, the factors which contribute to effective learning and teaching are:

1. **mutual respect between teacher and pupils;**
2. **democratic practices in the classroom;**
3. **relevance of the learning experiences to both the children's own particular interests and their prior experience;**
4. **humanity from the teacher.**

Helpful Strategies for ETS

How can I get work?

☐ Join Emergency Teaching Agencies
☐ Circulate a C.V. to prospective schools

How can I increase my chances of being asked back?

☐ Get to know the teachers/Principal
☐ Be reliable and enthusiastic
☐ Leave regular classroom teacher a note
☐ *Teach*

How can I stay sane?

(Beforehand)
☐ Be prepared! Gather and organise resources
☐ Make a file of daystarters

(When you arrive at the school)
☐ Try to get there early
☐ Go to the office first and check timetable/procedures etc.
☐ Go to the library and raid the shelves

(When you get into the classroom)
☐ Stay calm!
☐ Find the work programme
☐ Check the cupboards/storerooms
☐ Let curious children help

What advice do children give ETs?

☐ Learn our names
☐ Have a sense of humour
☐ Don't stick to the same old routines for the whole day
☐ *Treat us as if we were your own class*

Copying from the blackboard, or worksheet after worksheet (the standby of all ETs) hardly satisfy those criteria. They will, in fact, establish an authoritarian regime.

This underlines the dilemma faced by the more 'progressive' teacher forced into ET work. Of course there may be problems in reconciling the expectations of the class's teacher and the school. An authoritarian ET stepping into a 'liberal' school may have an easier row to hoe than a 'progressive' ET stepping into an authoritarian school. It is tough on some ETs to be told by the Principal

> ...all we had to do was to start off with a tough, no nonsense approach... Then, when the students knew who was boss, we could ease up a bit.
>
> Gordon, p.24

Summarising the advice from books and articles on relief teaching, we see that ETs are required to be fairly heavy handed to maintain discipline, to employ many 'busy' or unrelated activities from their 'bag of tricks' and to abide by the rules of others, perhaps regardless of their own convictions. In addition ETs receive little if any professional development and feel industrially abandoned. However, Ron Hemmings, a retired deputy principal and an ET for nine years observes that

> There is no such thing as a typical day in the life of a casual relief... Those who enter casual relief teaching with a clear understanding of what to expect and how to approach difficulties, and who are confident and willing to give of themselves, provide a necessary service in a changing teaching system. With the right strategies the rewards are many.
>
> Hemmings, p.11

Notes

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item 7

set
number one 1993

Peer Tutoring in Computer Skills

Cheryl Constable
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Nikki Slade

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Peer Tutoring in Computer Skills

Peer Tutoring in Computer Skills

CHILDREN, particularly those with home computers, often become more expert than their teachers. It then becomes tempting to use these children as experts in the classroom. Since peer tutoring has proved useful and successful, computer experts should be able to help as tutors. Integration/mainstreaming also suggests opportunities for peer tutoring. However, without adequate planning many of the benefits of peer tutoring may be lost. Here is an example.

Recently I observed two third formers (Year 8s) tutoring two sixth formers (Year 11s), on a one-to-one basis, in the use of *HyperCard Stacks* on Apple Macintosh computers. The high school had no Macintosh trained staff but had Macintoshes on order. The school wanted the sixth formers to be introduced to *HyperCard*, and later in the year when the equipment arrived, the learners could in turn become tutors to their peers.

The third form (Year 8) tutors had become reasonably proficient at *HyperCard* the previous year. They were trained by a Macintosh representative while attending an intermediate school (Years 6 and 7) which taught the use of computers in association with library resources. These third formers had, as well, participated in Macintosh demonstrations at teachers' conferences, so it was assumed by the high school coordinators (who had no Macintosh experience) that they were proficient enough to tutor in *HyperCard*.

This peer tutoring programme was different from various other peer tutoring programmes in several ways. Firstly, the work was not remedial: it was an introduction to something new. Secondly, the tutors and the learners were not remedial students; they were, in fact, able students. And thirdly, the tutors were three years younger than the learners.

As well as observing, at the end of the programme I gave a questionnaire to all four on their attitudes to the programme and gathered their recollections of what took place.

The two tutors, in the absence of any guidelines or training from their teachers, planned to teach their pupils the way they remembered being taught, task by task, the previous year. They were not equipped with any advance knowledge of how good the sixth formers were, nor with theories of learning.

The first of the six weekly two-and-a-half hour lessons went according to plan, with a demonstration which greatly motivated the learners and explored the first task – the use of fields.

However, the plan of instruction broke down from the second lesson onwards.

> *When I began teaching I worked it out so we would do such and such on this day and such and such next time but as we went along John would want to know this and this and so I found that the way I thought I'd go about things was breaking up.*

The two learners were very different people and the tutors found that their plan suited neither.

> *She had a very carefree attitude about the whole thing... I did stipulate certain features as being important 'must learn' ones but I'd give warnings/advice and/but most of the time it would be ignored... I'd be ready to go on but she wanted to keep playing around with the last thing'.*

The other was

> *...bright and you didn't really need to teach him... I got a bit bored.*

The plan was proving unsuccessful with both learners but for different reasons. Also the tutors could get no reinforcement from each other's experiences. Without a formal monitoring system in place the tutors felt that

> *...we could only talk to each other.*

Each week there were technical problems and often no teacher was available to assist: the password had been changed; there was a power cut; one sixth-former accidentally deleted vital information from the disk and it had to be reinstalled; and,

> *we phoned Apple Centre for help... but Apple wasn't interested.*

The learners enjoyed the lessons, felt relaxed and perceived that they had learnt a lot. From the second week onwards, the lessons were learner-driven, not by design but because the learners were older and the younger tutors were not confident enough to challenge them:

> *It was hard to tell a sixth former off.*

The learners felt in control which probably enhanced their learning, but the tutors were not happy with what they perceived to be a lack of control, and a shortfall in the amount of learning that took place. The tutors did not know how to deal with critical features being ignored, for example, the older children insisting on not being given demonstrations after the first lesson. Nor could they deal with requests for information which were sidetracks from the main direction. The tutors did not know how to control their frustration nor the learners' frustration.

> *If I ever did something like that again... things would have to be organised better.*

The lack of monitoring and evaluation prevented the problems from being noticed, and therefore prevented any solution.

Discussion

This peer tutoring situation allowed two sixth formers to learn something new and exciting, but allowed two able and skilled third formers to learn virtually nothing, and made them feel frustrated and ineffective. However, the tutors were keen to do it again, but only if

(1) they could get more time to familiarise themselves with *HyperCard* prior to tutoring,

(2) they could be trained in *'how to teach'*, and

(3) there was more teacher support.

Considering their negative experiences, that they were keen to try again suggests that peer tutoring is an exciting venture. However, the young tutors are just like us. They don't want to teach or tutor in a situation where they feel they are failing. They want tried and true guidelines, experienced support, monitoring and management of their learning, feedback, and perhaps even a mentor. How can teachers provide it?

Limbrick, McNaughton and Cameron, in an earlier *set*, and Wood, Bruner and Ross, note some key components of successful peer tutoring programmes. These are more fully explained later. In summary, however:

- design the peer tutoring schedule; its duration, sequence and materials;
- select the tutors and learners; explain how peer-tutoring works; set up separate times for monitoring and discussion with tutors and learners;
- give two or more training sessions to the tutors before they meet the learners, (the less well they know the subject the more help they will need in tutoring);
- summarise the key tutoring points, and others you think are appropriate;
- gradually introduce these points using fun role-play (the quiet learner, the noisy learner, the self-reliant learner) – show them how you deal with different kinds of learners by thinking aloud; introduce a few points well rather than cover too much too soon;
- make sure you are available for the monitoring sessions and assure the pupils of your support;
- thank both the tutors and learners for their participation.

The potential in peer tutoring

We must make a clear distinction between informal groups of two or more children working together and discussing each other's work and the peer tutoring situation where one child has been asked to tutor another. When children talk to one another this enhances reasoning skills because group feedback helps all attain the same goal. Where one child is the tutor this supplements a teacher's instruction.

There are several well known positive academic advantages in peer tutoring and also advantages for self-esteem, co-operation and motivation. Much of this research has been done with same-age children or with a slightly older tutor, in reading and writing, particularly for remedial work. The advantages of peer tutoring are that

(1) it entails a programme that is individually suited to the learner with intense one-to-one instruction;

(2) there is immediate feedback;

(3) it is a private environment where the learner feels comfortable to ask more questions than usual and questioning techniques improve;

(4) a mutually supportive relationship can develop inside and outside of the classroom;

(5) the extra practice improves the tutor's as well as the learner's skills in that subject.

There is usually a relaxed atmosphere during peer tutoring but this does not mean that little is being learnt. Quite the reverse; work by Nastasi, Clements and Battista in 1990 shows that social interaction in a learning environment assists cognitive development.

However, if pupils are going to instruct others, then tutors need specific training, and constant monitoring if they are to be effective. To be effective Wood, Bruner and Ross suggest that the tutor needs to be equipped with two theories; one is the theory of the task (and how it can be completed), and the other is a theory about the performance characteristics of the learner.

Wood et al. also suggest training the tutors to use their scaffolding process' to build a structured learning environment by:

- actively recruiting interest in the task at the beginning and then easing the learner into participating;
- reducing the task into small manageable components so that the learners can recognise when they have perfected a part;
- maintaining the intended direction of the lesson by resisting sidetracking, by restricting endless repetition of elementary level success, and by encouraging risk-taking to advance to the next step;
- marking critical features of the task to identify the minimum component requirements of a task, identifying those parts of the task which are dependent on other parts, and judging the discrepancy between the learner's attempt and a correct reproduction of the task;
- controlling frustration through using appropriate feedback, motivation and sympathy, by encouraging independent learning and avoiding unnecessary dependency on the tutor; and
- demonstrating or modelling the correct form of the task so that the learner can imitate.

Limbrick, McNaughton and Cameron suggest that any peer tutoring programme should be designed as

short,

frequent lessons (4 to 5 times a week),

for a period of up to 6 weeks,

monitoring should take place frequently (either by the tutor recording in a diary and regularly discussing it with the monitoring teacher or by video or tape recording occasional lessons).

This provides the tutor with a forum to ask questions, it provides an opportunity for the tutor to learn better tutoring methods, and it allows the tutor's efforts to be recognised. Monitoring can prevent the situation Shrock and Stepp describe of a child computer expert who dominated the keyboard, ignored other children's questions, gave no positive feedback and actively discouraged others from exploring and participating.

Conclusion

Computers are so very interesting, and it is very easy to get smitten with them. Tutors may find learners getting sidetracked more often in computing than in other subject areas. It is ironic that the training of teachers in computing has taken such a low priority in educational policy.

The school staff were surprised at the outcome, disappointed that two able computing students had such a difficult time, but extremely open to suggestions and research on peer tutoring.

I am grateful to the four students and staff involved for the opportunity to observe and interview, for their time, and for their constructiveness in dealing with the findings.

Notes

MS CHERYL CONSTABLE was a student in the Department of Education, Massey University, Palmerston North, New Zealand when she did this research. Since then she has been working for the NZ Council for Educational Research, Box 3237, Wellington, New Zealand.

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We thank the editors Dr Bruce McMillan and Dr Kwok-Wing Lai for permission to reprint it.

The books and articles mentioned are

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The learners felt in control of their learning which probably enhanced their learning. This idea is supported by research which can be read in

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set
number one 1993

Examsmanship and the Liberal Arts

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EXPERT GUIDANCE ON EXAMSMANSHIP
J. Gillespie 93

This essay was written at the request of the Committee on Educational Policy of the Faculty of Arts and Science, Harvard University, as a contribution to a collection of papers on examinations. March 1963. It is here slightly abridged.

1

'But sir, I don't really deserve it, it was mostly bull, really.' This disclaimer from a student whose examination we have awarded a straight 'A' is wondrously depressing. The hero-villain of this parable is the Abominable Mr Metzger '47. Since I celebrate his virtuosity, I regret giving him a pseudonym, but the peculiar style of his bravado requires me to honour also his modesty. Bull in pure form is rare: there is usually some contamination by data. The community has reason to be grateful to Mr Metzger for having created an instance of laboratory purity, free from any adulteration by matter. The more credit is due him, I think, because his act was free from premeditation, deliberation, or hope of personal gain.

Mr Metzger stood one rainy November day in the lobby of Memorial Hall. A junior, concentrating in Mathematics, he was fond of diverting himself by taking part in the drama, a penchant which may have had some influence on the events of the next hour. He was waiting to take part in a rehearsal in Sanders Theatre, but as sometimes happens, no other players appeared. Perhaps the rehearsal had been cancelled without his knowledge? He decided to wait another five minutes.

Students, meanwhile, were filing into the Great Hall opposite, and taking seats at the testing tables. Spying a friend crossing the lobby toward the Great Hall's door, Metzger greeted him and extended appropriate condolences. He inquired, too, what course his friend was being tested in. 'Oh, Soc. Sci. something-or-other.' 'What's it all about?' asked Metzger, and this, as Homer remarked of Patroclus, was the beginning of evil for him.

'It's about Modern Perspectives of Man and Society and All That,' said his friend. 'Pretty interesting, really.'

'Always wanted to take a course like that,' said Metzger. 'Any good reading?'

'Yeah, great. There's this book' – and his friend did not have time to finish.

'Take your seats please,' said a stern voice beside them. The idle conversation had somehow taken the two friends to one of the tables in the Great Hall. Both students automatically obeyed; the proctor put blue books before them; another proctor presented them with copies of the printed hour-long test.

Mr Metzger remembers afterwards a brief misgiving that was suddenly overwhelmed by a surge of curiosity and puckish glee. He wrote 'George Smith' on the blue book, opened it, and addressed the first question.

I must pause to exonerate the Management. The Faculty has a rule that no student may attend an examination in a course in which he is not enrolled. To the wisdom of this rule the outcome of this deplorable story stands witness. The Registrar, charged with the enforcement of the rule, has developed an organization with procedures which are certainly the finest to be devised. In November, however, class rosters are still shaky, and on this particular day another student, named Smith, was absent. As for the culprit, we can reduce his guilt no further than to suppose that he was ignorant of the rule, or, in the face of the momentous challenge before him, forgetful.

We need not be distracted by Metzger's performance on the 'objective' or 'spot' questions on the test. His D on these sections can be explained by those versed in the theory of probability. Our interest focuses on the quality of his essay. It appears that when Metzger's friend picked up his own blue book a few days later, he found himself in company with a large proportion of his section in having received on the essay a C+. When he quietly picked up 'George Smith's' blue book to return it to Metzger, he observed that the grade for the essay was A-. In the margin was a note in the section man's hand. It read, 'Excellent work. Could you have pinned these observations down a bit more closely? Compare ... in ... pp ....'

Such news could hardly be kept quiet. There was a leak, and the whole scandal broke on the front page of Tuesday's *Crimson*. With the press Metzger was modest, as becomes a hero. He said that there had been nothing to it at all, really. The essay question had offered a choice of two books, Margaret Mead's *And Keep Your Powder Dry* or Geoffrey Gorer's *The American People*. Metzger reported that having read neither of them, he had chosen the second 'because the title gave me some notion as to what the book might be about.' On the test, two critical comments were offered on each book, one favourable, one unfavourable. The students were asked to 'discuss.' Metzger conceded that he had played safe in throwing his lot with the laudatory of the two comments, 'but I did not forget to be balanced.'

I do not have Mr Metzger's essay before me except in vivid memory. As I recall, he took his first cue from the name Geoffrey, and committed his strategy to the premise that Gorer was born in an 'Anglo Saxon' culture, probably English, but certainly 'English speaking.' Having heard that Margaret Mead was a social anthropologist, he inferred that Gorer was the same. He then entered upon his essay, centring his inquiry upon what he supposed might be the problems inherited in an anthropologist's observation of a culture which was his own, or nearly his own. Drawing in part from memories of table-talk on cultural relativity and in part from creative logic, he rang changes on the relation of observer to observed, and assessed the kind and degree of objectivity which might accrue to an observer through training as an anthropologist. He concluded that the book in question did in fact contribute a considerable range of 'objective,' and even 'fresh,' 'insights into the nature of our culture. 'At the same time,' he warned, 'these observations must be understood within the context of their generation by a person only partly freed from his embeddedness in the culture he is observing, and limited in his capacity to transcend those particular tendencies and biases which he has himself developed as a personality in his interaction with this culture since his birth. In this sense the book portrays as much the character of Geoffrey Gorer as it analyzes that of the American people.' It is my regrettable duty to report that at this moment of triumph Mr Metzger was carried away by the temptations of parody and added, 'We are thus much the richer.'

In any case, this was the essay for which Metzger received his honour grade and his public acclaim. He was now, of course, in serious trouble with the authorities.

I shall leave him for the moment to the mercy of the Administrative Board of Harvard College and turn the reader's attention to the section man who ascribed the grade. He was in much worse trouble. All the consternation in his immediate area of the Faculty and all the glee in other areas fell upon his unprotected head. I shall now undertake his defense.

I do so not simply because I was acquainted with him and feel a respect for his intelligence; I believe in the justice of his grade! Well, perhaps 'justice' is the wrong word in a situation so manifestly absurd. This is more a case in 'equity.' That is, the grade is equitable if we accept other aspects of the situation which are equally absurd. My proposition is this: if we accept as valid those C grades which are accorded students who, like Metzger's friend, demonstrated a thorough familiarity with the details of the book without relating their critique to the methodological problems of social anthropology, then 'George Smith' deserved not only the same, but better.

The reader may protest that the C's given to students who showed evidence only of diligence were indeed not valid and that both these students and 'George Smith' should have received E's. To give the diligent E is of course not in accord with custom. I shall take up this matter later.

At this point I need a short-hand. It is a curious fact that there is no academic slang for the presentation of evidence of diligence alone. 'Parroting won't do: it is possible to 'parrot' bull. I must beg the reader's pardon, and, for reasons almost too obvious to bear, suggest 'cow.'

Stated as nouns, the concepts look simple enough: cow (pure): data, however relevant, without relevancies; bull (pure): relevancies, however relevant, without data.

The reader can see all too clearly where this simplicity would lead. I can assure him that I would not have imposed on him this way, were I aiming to say that knowledge in this university is definable as some neuter compromise between cow and bull, some infertile hermaphrodite. This is precisely what many diligent students seem to believe: that what they must learn to do is to 'find the right mean' between 'amounts' of detail and 'amounts' of generalities. Of course this is not the point at all. The problem is not quantitative, nor does its solution lie on a continuum between the particular and the general. Cow and bull are not poles of a single dimension. A clear notion of what they really are is essential to my inquiry, and for heuristic purposes I wish to observe them further in the celibate state.

When the pure concepts are translated into verbs, their complexities become apparent in the assumptions and purposes of the students as they write:

> To cow (v. intrans.) or the act of cowing: To list data (or perform operations) without awareness of, or comment upon, the contexts, frames of reference, or points of observation which determine the origin, nature, and meaning of the data (or procedures). To write on the assumption that 'a fact is a fact.' To present evidence of hard work as a substitute for understanding, without any intent to deceive.
>
> To bull (v. intrans.) or the act of bulling: To discourse upon the contexts, frames of reference, and points of observation which would determine the origin, nature, and meaning of data if one had any. To present evidence of an understanding of form in the hope that the reader may be deceived into supposing a familiarity with content.

At the level of conscious intent, it is evident that cowing is more moral, or less immoral, than bulling. To speculate about unconscious intent would be either an injustice or a needless elaboration of my theme. It is enough that the impression left by cow is one of earnestness, diligence, and painful naivete. The grader may feel disappointment or even irritation, but these feelings are usually balanced by pity, compassion, and a reluctance to hit a man when he's both down and moral. He may feel some challenge to his teaching, but none whatever to his one-up-manship. He writes in the margin: 'See me.'

We are now in a position to understand the anomaly of custom: as instructors, we always assign bull an E, when we detect it: whereas we usually give cow a C, even though it is always obvious.

After all, we did not ask to be confronted with a choice between morals and understanding (or did we?). We evince a charming humanity, I think, in our decision to grade in favour of morals and pathos. 'I simply *can't* give this student an E after he has *worked* so hard.' At the same time we tacitly express our respect for the bullster's strength. We recognize a colleague. If he knows so well how to dish it out, we can be sure that he can also take it.

Of course it is just possible that we carry with us, perhaps from our own school-days, an assumption that if a student is willing to work hard and collect 'good facts' he can always be taught to understand their relevance, whereas a student who has caught on to the forms of relevance without working at all, is a lost scholar.

But this is not in accord with our experience.

It is not in accord either, as far as I can see, with the stated values of a liberal education. If a liberal education should teach students 'how to think,' not only in their own fields but in fields outside their own – that is, to understand 'how the other fellows order knowledge' – then bulling, even in its purest form, expresses an important part of what a pluralist university holds dear, surely a more important fact than the collecting of 'facts that are facts' which schoolboys learn to do. Here then, good bull appears not as ignorance at all but as an aspect of knowledge. It is both relevant and 'true.' In a university setting good bull is therefore of more value than 'facts,' which, without a frame of reference, are not even 'true' at all.

Perhaps this value accounts for the final anomaly: as instructors, we are inclined to reward bull highly, *where we do not detect its intent*, to the consternation of the bullster's acquaintances. And often we do not examine the matter too closely. After a long evening of reading blue books full of cow, the sudden meeting with a student who at least understands the problems of one's field provides a lift like a draught of refreshing wine, and a strong disposition toward trust.

This was, then, the sense of confidence that came to our unfortunate section man as he read 'George Smith's' sympathetic considerations.

2

In my own years of watching over students' shoulders as they work, I have come to believe that this feeling of trust has a firmer basis than the confidence generated by evidence of diligence alone. I believe that the theory of a liberal education holds. Students who have dared to understand people's real relation to their knowledge have shown themselves to be in a strong position to learn content rapidly and meaningfully, and to retain it. I have learned to be less concerned about the education of students who have come to understand the nature of mankind's knowledge, even though they have not yet committed themselves to hard work, than I am about the education of the students who, after one or two terms at Harvard are working desperately hard and still believe that collected 'facts' constitute knowledge. The latter, when I try to explain to them, often understand me to be saying that they 'don't *put in enough* generalities.' Surely they have 'put in *enough* facts.'

I have come to see such quantitative statements as expressions of an entire, coherent epistemology. In grammar school the students are taught that Columbus discovered America in 1492. The *more* such items they get 'right' on a given test, the more they are credited with 'knowing.' From years of this sort of thing it is not unnatural to develop the conviction that knowledge consists of the accretion of hard facts by hard work.

The students learn that the more facts and procedures they can get 'right' in a given course, the better will be their grades. The more courses they take, the more subjects they have 'had,' the more credits they accumulate, the more diplomas they will get, until, after graduate school, they will emerge with their doctorates, members of the community of scholars.

The foundation of their entire life is the proposition that a fact is a fact. The necessary correlate of this proposition is that a fact is either right or wrong. This implies that the standard against which rightness or wrongness of a fact may be judged exists *someplace* – perhaps graven upon a tablet in a Platonic world outside and above *this* cave of tears. In grammar school it is evident that the tablets, which enshrine the spelling of a word or the answer to an arithmetic problem are visible to my teacher, who need only compare my offerings to it. In high school I observe that my English teachers disagree. This can only mean that the tablets in such matters as the goodness of a poem are distant and obscured by clouds. They surely exist. The pleasing of befuddled English teachers degenerates into assessing their prejudices, a game in which I have no protection against my competitors more glib of tongue. I respect only my science teachers, authorities who *really know*. Later I learn from them that 'This is only what we think *now*.' But eventually, surely .... Into this epistemology of education, apparently shared by teachers in such terms as 'credits,' 'semester hours,' and 'years of French' the student may invest his ideals, his drive, his competitiveness, his safety, his self-esteem, and even his love.

College raises other questions: by whose calendar is it proper to say that Columbus discovered America in 1492? How, when, and by whom was the year 1 established in this calendar? What of other calendars? In view of the evidence for Leif Ericson's previous visit (and the American Indians), what historical ethnocentrism is suggested by the use of the word 'discover' in this sentence? As for Leif Ericson, in accord with what assumptions do *you* order the evidence?

These questions and their answers are not 'more' knowledge. They are devastation. I do not need to elaborate upon the epistemology, or rather epistemologies, they imply. A fact has become at last 'an observation or an operation performed in a frame of reference.' A liberal education is founded in an awareness of frame of reference even in the most immediate and empirical examination of data. Its acquirement involves relinquishing hope of absolutes and of the protection they afford against doubt and the glib-tongued competitor. It demands an ever widening sophistication about systems of thought and observation. It leads, not away from, but *through* the arts of gamesmanship to a new trust.

This trust is in the value and integrity of systems, their varied character, and the way their apparently incompatible metaphors enlighten, from complementary facets, the particulars of human experience. As one student said to me: 'I used to be cynical about intellectual games. Now I want to know them thoroughly. You see I came to realize that it was only when I knew the rules of the game cold that I could tell whether what I was saying was tripe.'

We too often think of the bullster as cynical. He can be, and not always in a light-hearted way. We have failed to observe that there can lie behind cow the potential of a deeper and more dangerous despair. The moralism of sheer work and obedience can be an ethic that, unwilling to face a despair of its ends, glorifies its means. The implicit refusal to consider the relativity of both ends and means leaves the operator in an unconsidered proprietary absolutism. History bears witness that in the pinches this moral superiority has no recourse to negotiation, only to force.

A liberal education proposes that man's hopes lies elsewhere: in the negotiability that can arise from an understanding of the integrity of systems and of their origins in man's address to his universe. The prerequisite is the courage to accept such a definition of knowledge. From then on, of course, there is nothing incompatible between such epistemology and hard work. Rather the contrary.

I can now at least let bull and cow get together. The reader knows best how a productive wedding is arranged in his own field. This is the nuptial he celebrates with a straight A on examinations. The masculine context must embrace the feminine particular, though itself 'born of woman.' Such a union is knowledge itself, and it alone can generate new contexts and new data which can unite in their turn to form new knowledge.

In this happy setting we can congratulate in particular the Natural Sciences, long thought to be barren ground to the bullster. I have indeed drawn my examples of bull from the Social Sciences, and by analogy from the Humanities. Essay-writing in these fields has long been thought to nurture the art of bull to its prime. I feel, however, that the Natural Sciences have no reason to feel slighted. It is perhaps no accident that Metzger was a mathematician. As part of my researches for this paper, furthermore, a student of considerable talent has recently honoured me with an impressive analysis of the art of amassing 'partial credits' on examinations in advanced physics. Though beyond me in some respects, his presentation confirmed my impression that instructors of Physics frequently honour (in examinations) operations structurally similar to those requisite in a good essay.

The very qualities that make the Natural Sciences fields of delight for the eager gamesman have been essential to their marvellous fertility.

3

As priests of these mysteries, how can we make our rites more precisely expressive? The students who merely cow, rob themselves, without knowing it, of their education and their soul. The students who only bull rob themselves, as they know full well, of the joys of inductive discovery – that is, of engagement. The introduction of frames of reference in the new curricula of Mathematics and Physics in the schools is a hopeful experiment. We do not know yet how much of these potent revelations the very young can stand, but I suspect they may rejoice in them more than we have supposed. I can't believe they have never wondered about Lief Ericson and that word 'discovered,' or even about 1492. They have simply been too wise to inquire.

Increasingly in recent years better students in the better high schools and preparatory schools are allowed to inquire. In fact they appear to be receiving both encouragement and training in their inquiry. I have the evidence before me.

Each year for the past five years all freshmen entering Harvard and Radcliffe have been asked in freshman week to 'grade' two essays answering an examination question in history. They are then asked to give their reasons for their grades. One essay, filled with dates, is 99 percent cow. The other, with hardly a date in it, is a good essay, easily mistaken for bull. The 'official' grades of these essays are, for the first (alas!) C+, 'because he has worked so hard,' and for the second (soundly, I think) B+. Each year a larger majority of freshmen evaluate these essays as would the majority of the faculty, and for the faculty's reasons, and each year a smaller minority give the higher honour to the essay offering data alone. Most interestingly, a larger number of students each year, while not overrating the second essay, award the first the straight E appropriate to it in a college of liberal arts.

For us who must grade students in a university, these developments imply a new urgency, did we not feel it already. Through our grades we describe for the students, in the showdown, what we believe about the nature of knowledge. The subtleties of bull are not peripheral to our academic concerns. That they penetrate to the centre of our care is evident in our feelings when a student whose good work we have awarded a high grade reveals to us that he does not feel he deserves it. Whether he disqualifies himself because 'there's too much bull in it,' or worse because 'I really don't think I've worked that hard,' he presents a serious educational problem. Many students feel this sleaziness; only a few reveal it to us.

We can hardly allow a mistaken sense of fraudulence to undermine our students' achievements. We must lead students beyond their concept of bull so that they may honour relevancies that are really relevant. We can willingly acknowledge that, in lieu of the date 1492, a consideration of calendars and the word 'discovered' may well be offered with intent to deceive. We must insist that this does not make such considerations intrinsically immoral, and that, contrariwise, the date 1492 may be no substitute for them. Most of all, we must convey the impression that we grade understanding qua understanding. To be convincing, I suppose we must concede to ourselves in advance that a bright student's understanding is understanding even if he achieved it by osmosis rather than by hard work in our course.

These are delicate matters. As for cow, its complexities are not what need concern us. Unlike good bull, it does not represent partial knowledge at all. It belongs to a different theory of knowledge entirely. In our theories of knowledge, it represents total ignorance, or worse yet, a knowledge downright inimical to understanding. I even go so far as to propose that we award no more C's for cow. To do so is rarely, I feel, the act of mercy it seems. Mercy lies in clarity.

P.S.
The reader may be afflicted by a lingering curiosity about the fate of Mr Metzger. I hasten to reassure him. The Administrative Board of Harvard College, whatever its satanic reputation, is a benign body. Its members, to be sure, were in a spot. They delighted in Metzger's exploit, but they were responsible to the Faculty's rule. The hero stood in danger of probation. The debate was painful. Suddenly one member, of a refined legalistic sensibility, observed that the rule applied specifically to 'examinations' and that the occasion had been simply an hour-test. Mr Metzger was merely 'admonished.'

Notes

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item 9

set
number one 1993

Content and Methods

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Introduction

THIS RESEARCH FOCUSED ON TEACHING methods, the content of the lessons, and the degree to which eight student teachers could say what they were teaching. Table 1, an extract from just one observation of one teacher, gives an idea of how the topics of this observational research were noted. In a lesson there is so much going on at once that it is difficult for even trained observers to sort the wood from the trees. In this case video recordings made it possible to go back over the lesson and concentrate on the aspects of methods and content. Interviews revealed the depth of the student teachers self-understanding. The research was carried out by teachers' college staff in the course of training young teachers.

Moral matters

In this *set* item we cannot, of course, show more than a few snippets of the data collected. Perhaps the most important discovery was that the hidden curriculum, so-called, is not hidden at all, especially from the children, at whom it is directed. Forty-seven percent (47%) of the content taught was about moral issues. In the chart you can pick out this content easily, from the gentle 'now we will go back to our desks quietly,' to the shaming 'Penny is not listening'.

These pieces of teaching, mostly concerned with propriety and decorum, have an indirect approach compared with the straight out facts which were taught. 'How many arms does an octopus have? Count them with me,' is pretty straightforward. But 'There are some rude people this morning,' is very much more indirect. I decided the teacher was teaching several things with this phrase – you may have a slightly different list but it will probably include (a) failure to listen is a sort of rudeness, (b) rudeness should be publicly condemned, (c) rudeness will be publicly condemned. It is a salutary exercise to look closely at what you are in fact teaching with up to half of what you say in class.

Most of these pieces of teaching (educational transactions) are usually lumped together as Control. But that does not do them justice. The teacher may be fighting for control, but a quick glance at the chart shows that the fight is carried on with reason and concern for human rights, equality, and democratic procedures. There is no powerplay of the blunt, 'Do as I say,' variety. But there is a lot of the reasoned 'If you kneel-up the person behind you can't see,' sort of remark. There are a lot of appeals to collective fairness and to the teacher's knowledge of how everyone should behave.

The data from this lesson showed that 47% of the content was about morality. From an examination of the individual propositions, it is evident that it was about proper classroom conduct – taking turns, listening attentively, being fair to other pupils, avoiding disrupting other pupils, keeping busy by being on the assigned learning task, and the like.

All of the propositions from the 24 observations (all of different topics and subjects) were analysed and classified in the same manner. The average was 47.4% content about morality and propriety and 52.6% about other matters (such as nature, animals, procedures for constructing craft figures, procedures for solving arithmetic problems and the like.)

Lesson plans

The amount of moral content contrasts sharply with the content mentioned in the lesson plans which the student teachers prepared for the observed sessions. The lesson plans listed about 64 topics, all of which were about matters other than morality and propriety. In addition, about half of the lesson plans (13 out of 24) conflated content with method. For example, one lesson plan listed as content, 'The teacher will demonstrate how to cut out and fold the propeller for the windmill, and the children will watch the demonstration, then cut out and fold their own propellers.' This is about the sequence in which things will be done, not about content. Another mistaken example from one of the lesson plans is, 'The teacher will distribute the magnets, cardboard, wood, paper clips and bits of plastic, and the children will explore what the magnets do to each of the objects.'

At times, a student teacher would omit the category of content from the lesson plan altogether and assert (falsely) that for the 20-minute time period under observation, there was no content, per se, because the teacher was 'only giving a test' or 'only reading a story' or 'only playing a game.'

Teaching methods

The teachers used a wide variety of teaching methods. Some of these appeared in Table 1, others do not show up in that example of just one 23 minute episode. Table 2 shows the methods used by the 8 student teachers during our three observations of each.

Table 2
Rank Ordered Frequency Count of Instances of Use of Each Teaching Method from Total Data (24 observations = 3 observations per student teacher)

Teaching method	Frequency of Use During 24 Observations	Frequency of Use as Percentages
Directing	759	27.8
Questioning	357	13.0
Describing	261	9.5
Evaluating	159	5.8
Demonstrating	156	5.7
Reprimanding	153	5.6
Praising	150	5.5
Advising	147	5.4
Assigning guided practice	111	4.0
Supervising	78	2.9
Observing	51	1.9
Answering pupils' questions	51	1.9
Listening	45	1.6
Affirming pupils' answers	36	1.3
Threatening	24	0.9
Arranging materials	21	0.8
Dramatic reading	21	0.8
Modelling	18	0.7
Collecting materials	18	0.7
Pausing	18	0.7
Explaining	15	0.5
Illustrating	15	0.5
Affirming pupils' assertions	12	0.4
Repeating pupils' answers	12	0.4
Distributing materials	9	0.3
Disaffirming pupils' assertions	6	0.2
Noting	6	0.2
Reading	6	0.2
Role Playing	6	0.2
Suggesting	6	0.2
Assigning unguided practice	3	0.1
Repeating pupils' questions	3	0.1
Total instances	2733	100

Educational Transactions

We discovered nothing the teacher says is wasted; every remark and gesture had a substantial content. That almost half had a moral content was surprising, but someone has to teach us how to behave in large groups.

The second of the main research questions asked what the content of the lessons was. In fact, the content ranged over a wide area of matters. It included physical, biological and hominological knowledge (i.e., knowledge about the physical world, the living world and the human world). It included analytic, empirical and normative propositions (i.e., sentences true by definition, true by observation, and true by evaluative reasoning). The content was constantly present, in every educational transaction.

Self Knowledge

The third question asked to what degree the student teachers could say what content they were teaching. It was apparent from their lesson plans, and from interviews before and after, that they suffered considerable confusion as to what constituted content, what content they were intending to teach, and what content they actually taught. It was also apparent that they did not consider as content the set of values and code of morality which they were communicating with their frequent admonishments of 'I want to see steady people, now,' or 'Only sensible people will be allowed to go to lunch,' or 'Only those sitting on their bottoms [on the floor] with backs straight will be chosen.'

Conclusions

The professional teacher has three priceless attributes: sensitivity, adequate theory and competence in performance. Professional teachers are sensitive to the needs, motivations and expectations of their students and the community. They have theoretical adequacy to the extent that they can soundly describe, explain and justify their educational decisions and practices. They have performative competence when they take effective action which maximises the opportunities for their students to achieve desirable intended learning outcomes. To develop these three attributes to an adequate level, student teachers need to achieve a thorough understanding of the content of what they are teaching (moral as well as scientific, technological, mathematical, etc.) as well as competence in their repertoire of teaching methods. There is no teaching and studying without content. There is no teaching and studying of content without method. You have to teach something, and you have to do it by some method; you have to learn something, and you have to learn it by some method.

Notes

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Table 1

An Observation of a Student Teacher with 6-year-olds

Time elapsed	Teacher says	Teacher gestures	Teaching method	Content Implied by Teacher's statements	Category of Content Moral/Other
The class began at 9.45 am	*[S-1] Yellow class, who can remember how to write the letter 'p'?*	Looks for raised hands	Questioning Directing	The proper conduct for pupils who wish to speak in class is to raise one's hand and wait for recognition from the teacher.	M
	[S-2] Everyone watch carefully.	Writes a 'p' on the blackboard	Directing Demonstrating	The proper way to write a 'p' is to draw a semi-circle with the open part on the left, draw a line vertically along the open part and extend the line for a distance equal to the diameter of the semi-circle.	O
1 min	*[S-3] How far does it go down?*	Points to the leg on the 'p'	Questioning Illustrating		
		Looks for raised hands	Observing		
		Writes a second 'p', then a third 'p'	Demonstrating Questioning		
	[S-4] It goes down twice as far, doesn't it?	Points to the leg on the 'p'in relation to the round part of the 'p'	Illustrating Directing Assigning guided practice		
	[S-5] Now, we will go back to our desks quietly and take out our writing books Write the date for the day at the top of the page.	Points to the chalk where the date is written.	Illustrating Observing	Pupils movements from the carpeted mat area to the tables and chairs should be quiet and orderly.	
		Waits for children to stop fidgeting and to sit straight and quietly	Directing		M
2 min	*[S-6] Echidnas [a group of pupils] may go. Koalas may go. Emus may go.*	Watches the children go to their desks	Observing	Pupils must wait for directions from the teacher to move from the carpeted area to the tables and chairs.	M
		Listens for unacceptable noise and talking	Listening	Pupils who sit quiety and with bottoms on the carpet will receive rewards and recognition from the teacher	M
		Moves about the classroom looking at children's work as they practice writing 'p's	Supervising Evaluating Advising	The leg of a 'p' should be twice length of the diametre of the semi-circle which forms the top of the 'p'. Neatness is a desirable quality in writing, and it will draw the praise of the teacher.	M

Time elapsed	Teacher says	Teacher gestures	Teaching method	Content Implied by Teacher's statements	Category of Content Moral/Other
3 min	*[S-7] That is nice and neat. Twice the distance of the line.*	Points to a child's writing book	Advising		
4 min 5 min 6 min		Moves about classroom looking at at children's work as they practise	Supervising Directing Describing		
7 min	*[S-8] Once finished with the first line, put your pens down and look to the front. Olivia, I have not asked anyone to get up out of their seat and walk around the room.*			It is improper conduct for pupils to leave their seats and move about the room without the teacher's permission.	M
		Waits for Olivia to take her seat. Waits for pupils to look to the front of the room	Observing	Without everyone paying attention, the teacher will not give group directions and advice.	O
8 min	*[S-9] Start from top and go down. Remember to leave a finger space between each letter. Don't start from the bottom. Start from the top. Now do another line.*				
9 min 10 min 11 min		Gives guidance to individual children	Directing Demonstrating Assigning guided practice Evaluating Supervising Advising	The correct spacing for a row of 'p's is one finger space between each 'p.'	O
12 min	*[S-10] If you have finished, you can shut your books.*		Directing	Pupils should wait quietly for the teacher's directions after having completed an assigned task.	M
				Shutting one's book and sitting quietly is a sign that one has completed one's work and is ready for further directions from the teacher.	M
13 min		Watches for children who have completed the writing exercise	Observing Directing	Pupils who sit quietly and straight in their chairs, with feet on the floor, are chosen first in classroom movements.	M
14 min	*[S-11] This group come sit on the floor.*	Points to the Koalas	Directing		
	[S-12] This group come sit on the floor.	Points to Kangaroos (who are sitting quietly and in an erect position)	Directing		

Time elapsed	Teacher says	Teacher gestures	Teaching method	Content Implied by Teacher's statements	Category of Content Moral/Other
	[S-13] This group. This group.	Points to Emus and Echidnas to indicate that they should	Directing Describing Directing	Pupils should be able to see a book and allow other pupils to see it while the teacher shows and reads the book.	M
15 min	*[S-14] Just making sure you can see the book.*	Moves to the easel where a giant book rests	Arranging		
		Looks at children to see who is watching and who might not be able to see	Observing Questioning		
	[S-15] What is this story about?	Looks for raised hands	Observing	A story generally has a topic or a theme.	O
		Chooses a child by pointing	Directing		
		Listens to answer	Listening	Pupils should be listened to while they speak with the permission of the teacher.	M
				The story is about the friendly dolphin.	O
	[S-16] Who is in the story?		Questioning		
		Looks for raised hands	Observing	The story has characters. There are main characters and secondary characters in this story.	O
		Chooses a child by pointing	Directing		
		Listens to answer	Listening	The main character in this story is the dolphin.	O
				The secondary characters are the octopus, the fish, the turtle, the lobster.	O
	[S-17] What do you think might be happening?		Questioning	A story has a sequence of events.	O
				In this story, a dolphin looks for friends, but can't find any.	O
				Eventually it does find a friend.	O
				Everyone needs a friend and should have a friend.	M
				If one looks long enough, one will always find a friend.	M
		Points to a picture in the story	Directing		
		Looks for raised hands	Observing		
16 min	*[S-18] Douglas! [Pause] Lucas! [Pause]*	Notices two children talking with each other and touching and pushing each other	Noting Reprimanding	Pupils who do not sit quietly and listen attentively to the teacher's questions, directions and remarks and to other children's	

Time elapsed	Teacher says	Teacher gestures	Teaching method	Content Implied by Teacher's statements	Category of Content Moral/Other
		Glares at Lucas and Douglas	Reprimanding	remarks (i.e. those who have been given permission by the teacher to speak) will be reprimanded by the teacher.	M
	[S-19] Penny is not listening.	Notices a third child talking	Noting Describing Reprimanding	Pupils who do not listen to the teacher and to pupils designated by the teacher will be reprimanded.	M
	[S-20] There are some rude people this morning.		Describing Reprimanding	Failure to listen is a form of rudeness Rudeness should be publicly condemned. Rudeness will be publicly condemned.	M M M
	[S-21] Everyone sitting down on your bottoms.		Directing	The proper way for pupils to sit on the floor during a story-reading session is to sit directly on their bottoms with backs straight and legs folded.	
	[S-22] If you kneel up, the person behind you can't see.		Explaining	Pupils should not kneel because it blocks the view of pupils in the back rows.	M
	[S-23] I don't think that is very fair.	Waits for all children to become silent, to sit squarely on their buttocks on the floor and to cease fidgeting. Some children's hands are still raised in response to the teacher's previous question	Evaluating	Blocking the view is unfair behaviour. Unfair behaviour should be avoided.	M M
17 min	*[S-24] Right. Good.*		Observing Evaluating Praising		
	[S-25] Hands down.		Directing		
	[S-26] I'm going to read this time. Everyone watch and listen		Describing		
	[S-27] 'The Friendly Dolphin...'	Reads dramatically the story of *The Friendly Dolphin*	Dramatic reading	Animals can be attributed with human characteristics, such as friendliness, gregariousness and playfulness. It is normal to want to play. Even if one is rejected in seeking a playmate, one	O M

Time elapsed	Teacher says	Teacher gestures	Teaching method	Content Implied by Teacher's statements	Category of Content Moral/Other
				should persist in the search for a playmate. If one persists, one will eventually succeed. Dolphins live in the sea, along with octopi, fish, sharks, turtles, crabbs, clams and lobsters. Besides sea animals, the sea is also home for plants such as seaweed and seagrasses.	M M O O
		Points to words with a pointer while reading	Directing	Each word has its own meaning and sound. The context of a word within a sentence glues clues as to its meaning.	O O
		Pauses at end of each page for each child to look at the illustrations on the page	Pausing		
19 min	*[S-28] Who has seen a dolphin before?*	Waits for hands to be raised. Listens to a child's answer	Questioning	Dolphins are part of some people's everyday experience.	O
	[S-29] Who liked the story?	Waits for hands to be raised	Questioning Directing	Stories can be enjoyed. Pupils should raise hands to seek permission to speak.	O M
	[S-30] Why did you like the story?	Chooses a child	Questioning	Stories can be liked for many reasons such as they entertain, they challenge, they provoke thought, they make one happy.	O O O O O
		Listens to child's answer	Directing Listening		
20 min	*[S-31] Okay, we'll read it again. Okay, follow along with me. Hands down. We'll read it together.*	Leads a choral reading of *The Friendly Dolphin*	Directing		
21 min	*[S-32] What does the octopus say? Remember?*	Listens to a chorus of answers	Questioning	The illustrations in a story provide clues as to what the accompanying text of the story states and means.	O
			Listening		
	[S-33] How many arms does the octopus have? Count them with me.	Counts the arms. with the pointer. The children count in chorus with the teacher	Questioning Directing	An octopus has 8 arms.	O
	[S-34] One, two, three, four, five, six, seven, eight. What are tentacles?	Chooses a child with raised hand	Questioning	The arms of the octopus are its tentacles. Each tentacle has a set of suction disks.	O O

Time elapsed	Teacher says	Teacher gestures	Teaching method	Content Implied by Teacher's statements	Category of Content Moral/Other
		Listens to the child's answer	Directing Listening	The octopus uses the disks to attach itself to rocks and other animals.	O
22 min	*[S-35] That's right.*		Evaluating		
	[S-36] What can you see in the picture?	Chooses a child with raised hand. Listens to the child's answer	Questioning Directing Listening	Fish and crabs live in the sea.	O
		Chooses a second child and listens to the child's answer	Directing Listening	Seaweed and lobsters live in the sea.	O
23 min	*[S-37] What else can you see?*		Questioning		
	[S-38] Sitting down on your bottoms!		Directing	Pupils should sit directly on their bottoms on the floor and not kneel.	M
	[S-39] I can hear people calling out.		Describing	Pupils should raise hands for permission to speak. Calling out without permission is forbidden.	M M
	[S-40]There is no need to call out.		Describing		
	[S-41] I can see your hands up.		Describing		
	[S-42] There is no need to sit on your knees.		Describing		
	[S-43] Sit on your bottom.		Directing		
The lesson ended at 10.08 am			Totals of Propositions in the Two Categories		M 29 O 32
			Percentages of Content in the Two Categories		M 47.5% O 52.5%

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What Mathematicians Do and why it is important in the classroom

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THE ONLY NECESSARY PREREQUISITE for reading this article is that, at some time or other, you have failed to balance your cheque book.

1. What do mathematicians actually do?

I have wondered for years why more students don't enjoy mathematics. I spend, and enjoy, a great many hours each week doing something which is, apparently, anathema to almost everyone else. Why is this so?

Leaving aside obvious answers about my twisted personality, I think the problem is that schools and universities usually teach only a small part of what mathematicians do. I suspect that the most exciting part of mathematics is too often kept out of sight of children. So let's see what research mathematicians do.

1. New Problems

First, mathematicians look about for new, worthwhile, unsolved, problems; mathematics is not all sewn up, done, and finished. There are in fact, more open problems today than there have ever been before, but it is very difficult to explain most of them to a layman. These problems require too much preliminary mathematics; to even understand the question, you often need to have studied for many years.

But there are still some problems that can be easily explained. One of these is the so-called Fermat's Last Theorem. He wrote in the margin of a library book that he had a proof of the result 'but the margin is too small to contain it'. I hope he was banned from the library! He should certainly have been banned from the mathematicians' guild: his tantalising scribble was made about 1650 and there is no known proof of the result even today.

So what is the problem? Well, most people know Pythagoras' Theorem. The square on the hypotenuse (the long side) of a right angled triangle equals the sum of the squares on the other two sides. Algebraically we can write this as $x^2 + y^2 = z^2$, where z is the length of the hypotenuse and x and y are the lengths of the other two sides. There are whole numbers (integers) which we can use instead of x, y, and z and end up with a true statement. These are called solutions to $x^2 + y^2 = z^2$. The famous 3, 4, 5 triangle used by builders from ancient Egypt to the present day to get a right angle, is one solution since $9 + 16 = 25$ ($3^2 + 4^2 = 5^2$). But a sort of 3-dimensional version of Pythagoras doesn't seem to work: ($3^3 + 4^3 \neq 5^3$); 27 + 64 does not equal 125. Does it ever work? What about $x^4 + y^4 = z^4$? Does that have integer (whole number) solutions for x,y,z?

As far as we know $x^n + y^n = z^n$ has *no* solutions in which x,y and z are whole numbers once n is greater than 2. But no-one has been able to prove this, despite Fermat's claim in the margin. So, there are still unsolved questions in mathematics. What else do mathematicians do, after they have found a problem?

2. Experimentation

When faced with a problem like that of Fermat, that can't be solved immediately, our mathematician plays around with it. In the case of Fermat's problem, the natural thing to do would be to try n = 3 and see if there are some integers x,y,z for which $x^3 + y^3 = z^3$.

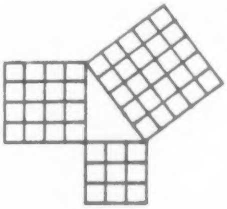
Having shown that there are no integer solutions in the case of n = 3, the next step is obvious. Test n = 4.

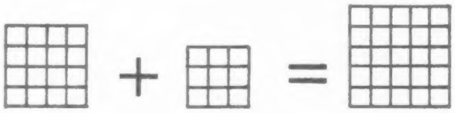
3. Conjecture

After some time working this way, the mathematician would be forced to conjecture.

C.1. For whole numbers n bigger than 2 you cannot get a whole number answer to $x^n + y^n = z^n$.

The conjecture has firmed up the problem (if it hadn't been firmed up from the start). Most frequently this is where the mathematician's experience and intuition come into play. Guessing the right conjecture is almost always the key step in finding new results.





4. *Proof*

The conjecture needs to be established as true, or condemned as false. We need a proof or a counter-example: just one case which doesn't fit the conjecture dooms it to failure.

And now the mathematician is on a see-saw. Try to find a proof. If you can't get all the way with a proof, find a counter-example. If you can't find a counter-example, try to find a proof following a different route. How this cerebral process works is anyone's guess. But generations of mathematicians have made progress this way. Even when a proof is found, the mathematician's work still isn't done.

5. *Generalise*

Suppose we have proved the conjecture C.1. How might we generalise or extend it? A generalisation might be

> G.1. For whole numbers n bigger than 2 there are no **fractions** x,y,z such that $x^n + y^n = z^n$.

Since whole numbers are fractions ($5 = \frac{5}{1}$, etc.) G1 is a genuine generalisation of C1. That is, C1 is a special case of G1. Proving the generalisation G.1. would immediately settle the Fermat Conjecture. So far, it hasn't been done.

An *extension* is a result which somehow grows out of the first result but is not a true generalization. An extension of Fermat's Conjecture is

> E.1. For whole numbers n greater than 2 you cannot get a whole number answer for $x^n + y^n + z^n = u^n$.

Now we are looking at *four* integers. So it is an extension rather than a generalisation. (By the way, even if you could get an answer, that would not completely prove the Fermat Conjecture, unless z can be zero.)

Mathematicians progress and develop a whole field of knowledge by this process of generalisation and extension. It is worth looking into any maths textbook to see how this process has worked there.

Although in the final published version, results are presented in large steps, they are usually developed in very small steps. Settling a host of little conjectures is usually the only way to achieve one reasonable-sized conjecture. It's often considered that knowing the right questions to ask, that is, making the right small conjectures, is really the heart of mathematics. A good mathematician is one who knows the right questions to ask.

Having developed a whole theory though, the mathematician is back at step one, looking for a problem. But if our mathematician is proud of the whole theory she or he will certainly want to spread it around.

6. *Publication*

Mathematicians don't accept *every* problem as worthwhile. Generally speaking, a result which doesn't have any generalisations or extensions which are of interest, is not thought worth spending research time on. Problems set for the International Mathematical Olympiad competition for secondary students are often in this category. They are not trivial questions but they don't lead anywhere; they are good for learning the mathematician's trade but they don't push mathematical frontiers forward.

What is considered a good problem may also be a matter of fashion. For instance, Gauss, one of the all-time-greats, worked on non-Euclidean geometry but did not publish his results because he thought other mathematicians would ridicule him.

Having solved what we think is a nice little problem, one which makes some contribution to an area of mathematics, we now have to write the problem up and hope that it will be published in some mathematical journal. For a Pure Mathematician this usually involves the statement of a theorem, its proof, finished off perhaps by a conjecture or a remark as to where the new result fits in to existing mathematical knowledge.

In this writing-up, just like a textbook, there is frequently no hint of all the trouble that went into the creation of the final work. Like a birth certificate it guarantees the existence of an individual but shows none of the effort (and fun) that its parents put into its creation, nor the attentions of the medical staff that helped bring it into the world.

Why do we publish such bare-bones information in Journals and textbooks when the really exciting part of mathematics is the creative part? Why do we show our students only the birth certificates? Is it embarrassment?

Once a paper has been submitted, the Journal editor passes the paper on to one or more referees. Is the paper correct? Have we indeed proved our result? And is the result sufficiently interesting to publish? If our paper passes the referees' tests, in due course it will appear in the journal and we will be provided with reprints that we can send to our friends to show them how clever we've been. We can put the paper in our curriculum vitae and, if we publish enough of sufficient quality, then we'll be promoted to Senior Lecturer or even Professor. It may even happen that our paper will spur someone else on to a generalisation or an extension and eventually solve a really major question.

Even when you think you've got it right though, the referee may find an error. Worse still, and this happened to me recently, even after the paper has been published, someone reading it may find a mistake. (Now that *is* embarrassing!)

Mathematics is not necessarily a game for hermits or recluses. Although many mathematicians still do work on their own, research papers are more and more often the product of two or more people. I personally find that joint research is more enjoyable and leads to fewer suicidal feelings when things are going badly. Usually too, results come more quickly because different people bring different experiences to bear on the problem in hand. And surprisingly 'talking' mathematics makes it clearer than mulling it around in your head. So mathematics does not have to be a game for one player.

I know very few mathematical research workers who don't enjoy what they're doing for its own sake – for the sake of treading where no-one previously trod. As a result, most of us spend far more than 40 hours a week on the job, for fun.

The Seven Steps of Mathematical Research

Step 1. Find a problem
Step 2. Experiment
Step 3. Conjecture
Step 4. Proof or counterexample
Step 5. Generalise or extend
Step 6. Publish
Step 7. Go to Step 1

2. What is mathematics?

I'm never totally sure that I know the answer to that question. However I will try to say not what mathematics is, in total, but rather what I think the most important ingredients are.

1. Objects

To me the most fundamental part of mathematics are its *objects*. These are the numbers, sets, algebraic quantities, graphs and so on, that are the basic items of study. Anything in the real or an *imagined* world is potentially an object for mathematics.

For instance, take points and lines. We think of them as real and use them to construct plans of houses, roads, aircraft, machines... which can be subjected to the rules of geometry as required. However, points and lines are imaginary objects in space; and that space is the one imagined by Euclid, which approximates to the real world on many occasions, but not all.

2. Algorithms

The second basic ingredient of mathematics are the rules of the particular game we are playing. These allow us to manipulate objects, kick them around, score goals if we're lucky. Called algorithms, they are well defined processes which do a particular job. A good algorithm will perform a particular function in a finite number of steps. Algorithms are almost always able to be converted into computer programs. All computer programs are algorithms.

The common algorithms that everyone has used in school are multiplication and division. The multiplication algorithm allows us to multiply two numbers. For instance, 24 x 17 is calculated as follows:

$$\begin{array}{r} 24 \\ \times\ \underline{17} \\ 168 \\ \underline{+\ 240} \\ 408 \end{array}$$

The division algorithm, in one form, works like this:

$$\begin{array}{r} \underline{24} \\ 17\overline{)\ 408} \\ \underline{-\ 34} \\ 68 \\ \underline{-\ 68} \\ 00 \end{array}$$

Although not often called an algorithm, we can think of the process of solving a linear equation as an algorithm. We illustrate the finite number of steps used in the example below.

$$\begin{array}{lrl} \text{Solve} & 3x - 6 & = 0 \\ & 3x & = 6 \\ & x & = \frac{6}{3} \\ & x & = 2. \end{array}$$

The algorithm implicit in these steps will solve any linear equation.

I regard mathematical formulae as algorithms because they give a well-defined method for solving certain problems. Hence $A = \pi r^2$ is an algorithm in the sense that it says, if you give me the radius of a circle, I will give you (in a finite number of steps) its area.

Similarly $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

is an algorithm for solving the quadratic equation

$$ax^2 + bx + c = 0.$$

3. Theorems and Logic

At a slightly higher level in the mathematical hierarchy we have theorems and logic. Logic acts on theorems in much the same way as algorithms act on objects. But, so far, it is not as easy to programme logic to manipulate theorems as it is to programme algorithms to manipulate objects.

Given an object I can perform an algorithm on it. Given a known result, it can be proved by following a sequence of logical steps. There is nothing original here. We just follow the train lines from one station to the next. There is nothing unexpected; we know the algorithm will produce the right result; we know that logic will correctly prove the next theorem.

4. Creativity

How does creativity fit in? Creativity produces new discoveries. It extends our list of theorems, algorithms and logical tools. It gives us more control over the world we live in.

Creativity produces problems which lead to conjectures. It enables us to find counter-examples to conjectures, or proofs for new theorems. It is creativity that leads to generalisations and extensions and provides connections between previously unrelated sections of the subject. We know creativity when we see it, and we know what it does. *How* it does it is still locked inside the brain.

In the future it may be possible to program a machine to be creative. But this creativity will have to be more than applying logic to one theorem to produce new theorems. This is because most theorems produced in this way will not be useful, nor will they be interesting. Part of the creativity of a mathematician is to be able to see what is potentially useful and interesting and link that to the mathematics that is currently known.

So mathematics consists of certain planks, and tools – the objects, algorithms, theorems and logic. But mathematics also involves an imaginative side, the creative part that enables new tools to be invented and the wood to grow and to be of more use; that produces results that have not been thought of before; that produces processes to be developed, that can't be found in any textbook or mathematical paper; that is the most interesting and satisfying part of the whole subject.

3. What to teach?

1. Being Creative

We are extremely good at exploring the objects of mathematics and at teaching any number of basic algorithms. At university we show our students endless theorems and often expect them to learn the proofs.

I first got fun from mathematics because I could continually get the right answer. It was not till later that I realized that there was a completely different side to it all. It was possible to produce something entirely new. My entirely new results were rather like finding a dead tree in the Opaharua Swamp. I had to (like Newton) stand on the shoulders of giants to do it. But I was seeing things that noone had seen before. It didn't matter that it was no more useful than a dead tree. It was *my* dead tree. And I kept hoping that, if I kept looking, there might be a swan behind the dead tree.

In recent years we've started to move towards more creativity in the mathematics classroom. This has been achieved to some extent by the introduction of problem solving. Students get a chance to take part in a search and sometimes get the feeling of discovery and creativity. Problem solving is the closest thing I know of at the school level, to real mathematical research. With good problems, students can go through all of the creative procedures: they can conjecture, find counter-examples, find proofs, generalise, extend, and even publish. In 1952, Ann Roe studied 64 eminent scientists. She found that the single most important factor in the final decision of these people to take up science, was the sheer joy of discovery. With problem solving we are giving children a taste of that joy.

There is a small bit of cheating involved here though: (i) the students generally do not dream up the problems for themselves, and (ii) the answer is already known to someone before the problem is posed. But it is a big step in the right direction.

2. Facts, and Using Them

The human race is storing up more and more facts each day. Probably they are being accumulated at an exponential rate. How can anyone even expect to learn them all? Luckily *knowing* facts is not as important as being able to *use* facts, and to use them in new and novel ways. It is necessary for our students to learn to think deductively and intuitively. We need to give them practice in creativity.

This is not to say that they should learn no facts. Of course, students need to know mathematical facts. They need to know about mathematical objects, algorithms, theorems, and logic. But they should also know how to generate *ideas*.

The reasons for this are because (i) creativity is an integral part of mathematics (and all other disciplines); (ii) we are trying to prepare our students for a world which will not be like today's world – possibly the best training we can give them is to be flexible, to think and to be creative.

There are clues from educationalists about how this may be done. Joseph Renzulli in his *The Enrichment Triad Model* has three types of enrichment which can lead students to genuinely creative experiences. I'll take up his themes in the next section, though they have already appeared implicitly. The only problem is likely to be a need for teachers to change their attitude – it is almost certain that some students will get away, will be off and running, so fast that teachers won't be able to keep pace with them. I often have this problem. Bright school students I've worked with and my graduate students often leave me behind. You just have to relax and enjoy it. Teachers should encourage their students to try out new ideas even if it means disrupting school timetables – perhaps for them to go to a library or visit an expert. And of course, not just for the study of Mathematics.

4. Renzulli was there first

Renzulli is an educator who developed his ideas through an interest in talented students in all areas, not just mathematics. At the heart of his programme are three kinds of enrichment activity – *Types I, II* and *III*. I have adapted his general ideas to the teaching of mathematics, and to the teaching of all pupils, whether obviously talented, or not.

Type I

Type I enrichment activities are general exploratory activities: the teacher provides experiences that put students in contact with topics or areas of study in which they may develop a sincere interest. Although the emphasis is on exploration, the students need to realise that it is purposeful exploration. Eventually students will be expected to conduct further study in one of their areas of interest.

Renzulli suggests 3 ways for students to explore: through interest centres, field trips and resource people. You may well be able to think of others. A mathematics **interest centre** could contain a range of books containing mathematics not met in the regular classroom, bibliographies of famous mathematicians, puzzle books, popular books on mathematically related topics, etc., appropriate to the level of the student. They could also contain a range of equipment. Apart from the obvious items, maybe you could find a theodolite, an astrolabe or some other exotic equipment. (At my last university I was custodian of three magnificent machines from the last century that variously found the arclength of a curve and constructed conics.) It's worth keeping your ear to the ground. It's amazing what equipment universities and companies discard. It's worth visiting antique shops too from time to time. Probably interest centres could also include these days, a computer and software. For example, there is some very nice fractal and chaos software available now.

It is fairly obvious what is meant by **field trips**. There are an increasing number of hands-on science museums springing up. These all have some mathematical items. My university encourages school classes to visit the university and I'm sure others do too. In Britain, I know that some airports are willing to take groups of students. That may be the case here as well. The Meteorological Office, a polling firm, an engineering design office, a standards testing lab, an actuary's department, a city or county council engineering branch, an economic forecasting firm etc., are all possibilities. The aim is to find local places where mathematics is actually being used in some form or other and see if they'll let you and your students in for a good look round.

Resource people could be friendly bearded professors, or people in government or industry. It's good for the students to see live mathematicians. Try to cultivate one or two that you know have a good story to tell or some good problems for the students to try.

In summary then, the *Type I* activities aim to broaden students' knowledge and experience by placing them in situations which are different to the regular classroom routine. It is hoped that this process may give students some particular interests that they will follow up to the *Type III* level.

Type II

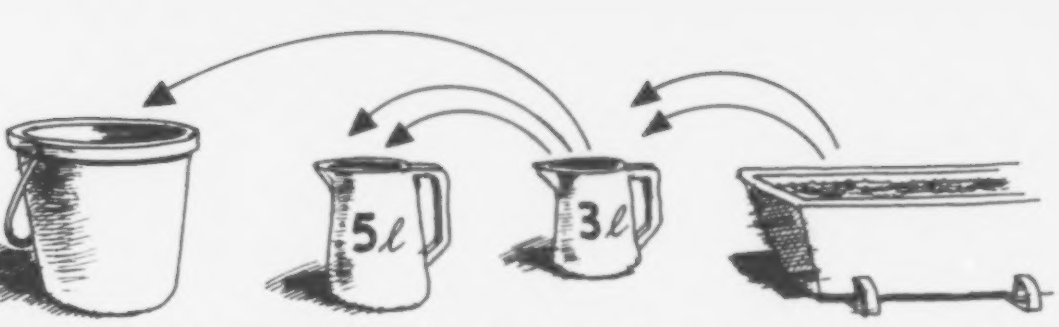
Type II activities are almost exclusively training exercises. But these are definitely *not* content-oriented. Hence *Type II* activities are meant to lead students to a mastery of the processes which enable them to deal more effectively with content. Learning how to use a formula or algorithm is not a *Type II* activity; but learning to select the right algorithm is. These activities include critical thinking, problem solving and brainstorming.

They should be planned so that they provide opportunities for developing thinking and feeling abilities to their highest potential. They should also give introductions to more advanced kinds of study and enquiry. It is hoped that they will provide skills and abilities to solve problems in a variety of areas and in new situations.

There are any number of mathematical problems and projects that students can undertake, on their own and in groups, that will facilitate *Type II* processes. These activities should highlight the processes at work, so that the pupils will be aware of their application in other situations. When is the Pigeon Hole Principle useful? When should counting techniques be used? Is now the time to generalise? What happens if we work from the other end? Is there just one counter-example? Could the computer do this for us? *Type II* activities should help students to learn the tricks of the mathematical trade.

Type III

In *Type III* enrichment activities the student becomes an actual **investigator** of a **real** problem using appropriate **methods of inquiry**. At this point students actually *become* mathematicians. They tackle a mathematical problem using the techniques that a mathematician would employ. Preferably (and this may be difficult to arrange) the problem they investigate is also a problem which they have taken an active part in devising.



It is very unlikely that students will be able to take complete responsibility for generating a problem which interests them. My experience is that (even at the Olympiad level) problem-producing does not come easily. However, the teacher needs to be ready to take an idea and help the student convert it into a viable problem.

This is not easy. After a while you develop an intuition for what might work, but you can never be sure. Sometimes the problems are too easy. Sometimes they are impossibly hard, in which case you have to learn to stop and go in another direction.

With original problems there is only one way to proceed: you have to jump in at the deep end. Therefore wise teachers stand by with a life jacket, just in case. If the student isn't able to swim it will be necessary to start again on a subset of the problem in order to produce something which will lead to a result.

Having produced the problem there may be no obvious technique to solve it. This is why *Type II* activities exist – to give some new techniques which might be useful. However, intuition and guesswork may be just as important.

Results

In a *Type III* activity it is important to communicate results. This should be more than putting the work on the classroom noticeboard. Perhaps the proof or extension could appear in a school magazine or newspaper. (After all, poems and stories appear there. Why not original maths?) A friendly academic may be able to recommend somewhere else, and exceptional work might be published in, for example, the *New Zealand Mathematics Magazine* or *Function*.

The attempt to publish or bring the result to the notice of an expert is important for three reasons. Firstly, it increases the chances that the problem has been truly solved, as experts will review it. Secondly, your solution may lead to new proofs and extensions by other people. Thirdly, and perhaps just as important, it gives recognition to the work; it says, 'Student, you have done well.'

So, following the three *Types* of activity Renzulli suggests, has led us to precisely what mathematicians do. Mathematicians search for a problem. Then they seek for ways to solve it. Finally they publish their result. Students can learn mathematics in this way too. In the process they will experience the joy of creating their own mathematics. Hopefully this will be more interesting and lead to better learning than the traditional algorithm learning approach to the subject.

5. Some Examples

Here are some examples of Type II activities developed into Type III activities. I hope you will see that, by taking almost any situation that you have been familiar with for a long time, can be developed into a Type III activity.

Example 1

(1.1) Given a 3 litre jug and a 5 litre jug and a water trough, can you measure out exactly 4 litres of water?

This is a fairly straightforward question that even young children can work at using trial and error. It can be developed into a project by going to the next question.

(1.2) Given a 3 litre jug and a 5 litre jug, what amounts of water can you measure?

This question is amenable to a rigorous proof by 11- and 12-year-olds. But first the students have to do some experimental work. (With pen and paper will do though it might be more fun with water.) The experimental work can lead to a conjecture and then the conjecture will need to be proved or a counter-example found.

The answer here is that any whole number of litres can be produced. The proof is to first get 1 litre. Once you have 1 litre you just keep adding 1 litre lots together and you eventually get any whole number of litres. It's important for students to

(a) get the idea of the proof, either through discussion in a group, or by their own individual experimenting,

(b) write up the proof.

At this stage brainstorming should come up with a whole host of problems related to (1.1) and (1.2). These will vary in sophistication depending on the maturity and ability of the students. With older students you might get them inventing the following problem (*Type III* activity).

(1.3) Given an x litre jug and a y litre jug, what amounts of water can you measure accurately?

A further extension : in (1.3) x and y will probably represent whole numbers.

(1.4) What if x and y are just *any* positive numbers?

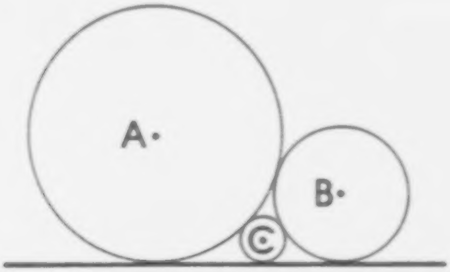
Students should work on whichever problem they come up with and produce a proof which is appropriate to their level of sophistication. For students who know the Euclidean Algorithm it is relatively straightforward to show that if x and y have no common factors, then all whole numbers of litres can be obtained.

(1.5) What if x and y have a greatest common factor of z though?

This activity can give students a chance to practice the creative side of mathematics. There is ample opportunity for experimentation, conjecture and proof, while all the time using known algorithms. (If an algorithm, such as the Euclidean Algorithm is needed but not known, then the students can be directed to a book to learn it for themselves, or it can be taught. This is potentially a *Type II* activity.) These activities can be used with small groups or a whole class. You could put the activities (1.1) to (1.5) on cards and let students work on one card at a time. But this leaves no obvious chance for *Type III* work.

How can it motivate a *Type III* activity? What possible problems come to mind as a result of this example? Of course, it's impossible to answer that question. It might be that the student goes for rods, x and y units long, and asks what lengths can be made with rods of these lengths. Who knows what they will come up with?

Example 2



(2.1) In the diagram the circle centre A has radius 2cm and the circle centre B has radius 1cm. What is the radius of circle C?

This problem can be solved by an application or two of Pythagoras' Theorem.

While not a strong *Type II* activity it does require some ingenuity to solve the problem. A common error is to assume that there is a right angle at C. In fact no matter what the radii of the two larger circles it can be shown that the $\angle ACB$ is never 90°. One nice problem is to explore the values of $\angle ACB$.

Brainstorm. What questions arise from (2.1)?

(2.2) Suppose the largest possible circle centre D is placed (squeezed) between the circles A and C, and the horizontal line. What is the radius of D?

(2.3) Repeat (1.2). In other words, find the radius of the largest circle which lies between the circles with centres A and D, and the horizontal line. In this way there are a whole series of circles wedged in between the circle centre A, the horizontal line and the last circle. Find a formula for the radii of all these.

Students should now try to develop their own *Type III* activity based on (2.1). Two possibilities are suggested below but there are possibly infinitely many other questions that could be posed.

(2.4) Let P_1 be the first circle (centre A) and P_2 the second circle (centre B). Let P_i be the largest circle contained between the circles P_{i-1}, P_{i-2} and the horizontal line, where $i \geqslant 3$. Find a formula for the radius of circle P_i.

(2.5) Let $P_1 = Q_1$, $P_2 = Q_2$ and $P_3 = Q_3$, where P_1, P_2, P_3 are as in (2.4). Let Q_i for $i \geqslant 4$ be the largest circle contained between Q_1, Q_2 and Q_{i-1}. Find a formula for the radius of Q_i.

Example 3.

(3.1) Call a number n *good*, if the numbers 1, 2, 3, ..., n, can be split into two groups such that the numbers in one group have the same sum as the numbers in the other.

(For students who know about sets, let $N = \{1, 2, 3, ..., n\}$. We say that n is *good* if N can be divided into two sets A and B such that $A \cup B = N$, $A \cap B = \emptyset$ and the sum of the numbers in A is equal to the sum of the numbers in B.)

This is a nice *Type II* exploration that has a simple solution. The proof that I know does depend on knowing the sum of the numbers in N. However, a lot can be gained from this problem without knowing this. Primary school students should be able to guess the pattern even if they can't prove that their conjecture is true.

Taking this activity on to *Type III* is possible, perhaps with several children brainstorming. Perhaps they will break N into 3 sets to see what problems arise.

Example 4.

(4.1) Now $9 = 4+5$ and $9 = 2+3+4$. So 9 can be written as the sum of a *consecutive* string of positive integers in two ways. Are there any numbers that cannot be written as a consecutive string of positive integers?

Experiment. Start with 1,2,3,4,5, ... and so on. This is a classic chase. Do you see any patterns? Can you make a conjecture? Can you prove the conjecture? All the good old stuff.

This problem like many others can be dealt with at a series of levels.

(i) Primary school students can, if nothing else, get good practice in arithmetic by looking for examples of numbers which are *not* the sum of a consecutive string.

(ii) Many of these students can make a reasonable conjecture.

(iii) The proof is probably difficult to expect till secondary school. I have seen bright 10- and 11-year-olds get there with help.

(iv) What questions does this problem suggest? Brainstorming, may bring up questions that pupils (and teachers) can't solve. In that event, ring up a sympathetic academic.

Clearly the *Type III* suggestions I've made are not *Type III* in the strictest sense of the word because they are not the student's *own* problems. However, students will come up with questions that I haven't thought of. They do it all the time. They just need encouragement and help.

Notes

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He recommends a chapter by Alan Schoenfeld as reinforcing and extending the ideas in this *set* item. It is

Schoenfeld, Alan H. (1992) Learning to think Mathematically: Problem Solving, Meta Cognition, and Sense-Making in Mathematics, in, Grouws, Douglas (Ed) (1992) *Handbook of Research Teaching and Learning*, New York: Macmillan.

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number one 1993

Hopes and Fears

OF STUDENTS IN AUSTRALIAN SCHOOLS

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WHAT DO YOUNG AUSTRALIANS in the 1990's expect out of life? What do they see as the problems facing themselves and their peers? How do they feel about the future? For answers to these questions we can make use of some of the items in a survey of 14- and 16-year-olds conducted in 1991 on behalf of seventeen Catholic secondary schools throughout Australia. The survey sampled 2,500 students in a range of schools, and covered the students' experiences of school, friendships and family life, their attitudes towards life in Australia, their values and attitudes, and their personal anxieties and attitudes towards the future.

Basic Evidence

The survey generally presented a consistent and positive picture. Most students were satisfied with their schools, rated their progress as good, came from intact and close families, and placed a high value on developing their abilities to the full, maintaining friendships and providing and caring for families of their own in the future. Alongside the generally positive findings there were some issues that emerged with regard to the 'relevance' of their school curriculum and the uncertainty many of them expressed about the future, particularly regarding their job prospects. These issues provided evidence about the students' hopes and fears as they faced life after school. What are their hopes for personal fulfilment, and what are the values and priorities they are already aiming at, as they face the prospect of determining their own futures?

Values and Priorities

To get some idea of their priorities in life we can look at a question which asked them what they would place emphasis on 'given that you had a secure and well-paid job in the future'. The answers suggested that factors of personal development and companionship rated more highly than those of money, status and power. The levels of 'importance' that resulted are shown in Table 1.

Table 1

	Score	Rank
to develop my abilities to the fullest	2060	1
to find self-fulfilment	1692	2
to spend time with other people	1519	3
to achieve a position of influence	1059	4
to become really rich	772	5
to make a contribution to society	749	6
to have authority over others	504	7

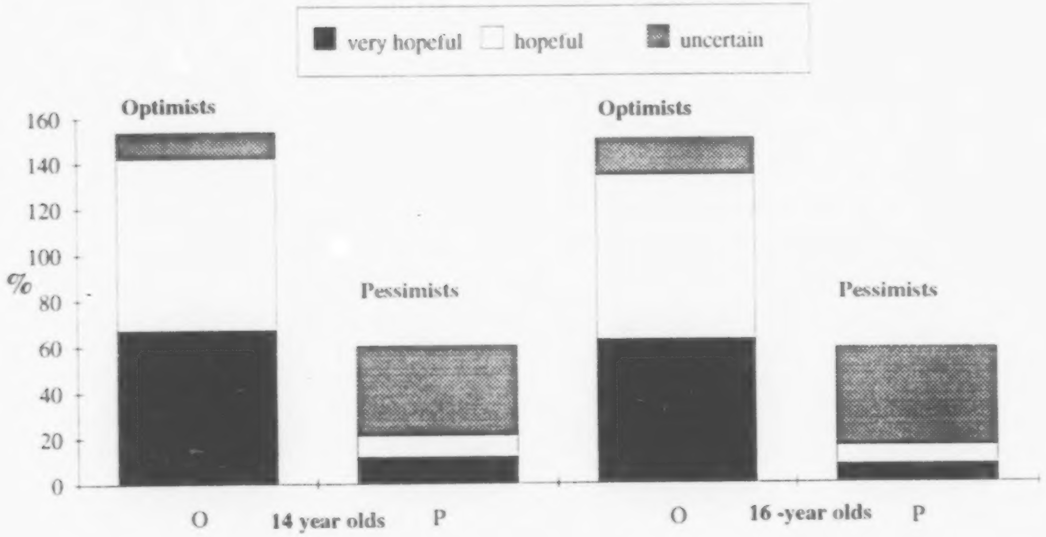
Life in Australia

When asked what they thought about life in Australia at present, the majority (57 percent) expressed dissatisfaction. The most frequently scored item (see Table 2) was that 'politicians only make our problems worse'. While 40 percent thought that Australians are easy and friendly people, as many as 36 percent appeared critical of our intake of migrants – particularly males in rural schools (with responses as high as 57 percent.)

Table 2

	Score	Rank
politicians only make our problems worse	1171	1
Australians are easy and friendly people	958	2
we should limit our intake of migrants	857	3
the future for young people is grim	839	4
we have fewer problems than other nations	812	5
everyone gets a fair go here	721	6
business and unions fight too much	636	7
too many extremes of poverty and wealth	569	8
big business has led the country into debt	538	9
we gain from being multicultural society	458	10
other	174	11

Chart 1: The Future



Personal Values

A series of questions was devoted to their personal values and ideals for the future. Family life was the dominant value in the minds of the students, along with friendships and financial security. When put alongside these values, religious interests were given low priority, although the regard for honesty and generosity (Table 3) could be read as counterbalancing this interpretation.

Table 3

	Score	Rank
to care and provide for a family	1463	1
to be financially secure	1352	2
to be honest and fair towards others	1073	3
to live up to the values of my parents	801	4
to be generous in my attitude to others	782	5
to make a lot of money	664	6
to do what I please with my life	544	7
to pursue a life of pleasure	462	8
to help people who are in need	419	9
to live up to my religious ideals	205	10
other	204	11

Similarly, while only one-third of students opted for living up to their parents' values, it could be argued that the items they gave priority to actually reflected the values that their parents hold.

The Future

This generally stable and secure picture changed considerably when the students were asked about their attitudes towards the future. The majority of them, and particularly those at the Year 11 (New Zealand Form 6) level, said that they did not 'often' feel hopeful or very hopeful about the future and that their most frequent feelings were ones of uncertainty or less hope. They split quite clearly into two groups: the optimists and the pessimists. The pessimists were in the *majority*, with as many as 57 percent of 16-year-olds in that group. The contrast between the two groupings was unmistakable, as Chart 1 indicates.

Personal Problems

Despite this contrast, when it came to identifying their own personal troubles, there was remarkable agreement between the optimists and the pessimists. The one issue that emerged as a *common* 'trouble' for most of them was 'getting a good job in the future'. The significant element here is that, although the question was aimed at identifying their current anxieties, the issue that emerged as a major preoccupation for them was an item concerned with their *future*. Even Year 9 (NZ Form 4) students who indicated that they intended to stay on until Year 12 (NZ Form 7) saw this as their main worry in the present – even though they were four years away from making definite career choices. This preoccupation was reinforced in a later question which asked them to identify the main issues facing their own generation. In their response to this question the concern about a lack of jobs was given even greater prominence with 77 percent of all students nominating the *lack of jobs* as the issue of major importance.

Table 4

	Score	Rank
getting a good job in the future	1539	1
lack of money	920	2
relationships with friends	842	3
personal appearance	817	4
family relationships	616	5
relationships with teachers	500	6
lack of popularity	461	7
sexuality	348	8
peer-group pressure to use alcohol	235	9
pressure to use other drugs	225	10
other	204	11
violence in the home	132	12

Gender Differences

There were some significant differences between the responses of males and females, particularly in the questions of values and priorities.

Thus, in the question which asked about career values, males were much more likely to say riches were an ambition (41 percent to 17 percent.) Males also placed more emphasis on having influence (48 percent to 38 percent) and authority (27 percent to 11 percent), while females favoured self-fulfilment (76 percent to 68 percent), spending time with people (71 percent to 59 percent) and making a contribution to society (35 percent to 29 percent).

In the questions about their personal values and priorities females also favoured 'other-directed' options:

caring for others	(54 percent to 46 percent)
contributing to society	(33 percent to 26 percent)
being generous	(36 percent to 31 percent)
helping the needy	(25 percent to 14 percent)
being honest and fair	(56 percent to 39 percent)

Males gave higher priority to their parents' values (38 percent to 25 percent) and making money (35 percent to 15 percent), and in the question concerning the future, males were more often very hopeful (40 percent) than females (29 percent).

Chart 2 displays the more important contrasts.

Implications

What, then, do these results tell us about the lives and outlook of this particular group of 14- and 16-year-olds in a set of Catholic schools across Australia?

First, these young people have positive experiences of schooling, friendship and have close family relationships. In this they appear to be much more secure and protected than many of their contemporaries. The responses to questions about the family suggested that a secure, stable family background was common to the vast majority. Eighty-five percent came from two-parent families, and almost all of these were 'original parent' families. In Australia about one in five children (20 percent) can expect, before they reach adulthood, to experience the divorce of their parents; only 11 percent of our students came from separated families. Yet, *despite* this stability and family support, the students manifest a real concern, and even a lack of hope, about the future. Clearly the dominant fear of the students, in all the schools, centres on what is going to happen *to them* once they move outside or beyond their protective home and school environment. In this, they share the concerns of their peers whose formative experiences have been much less supportive than theirs.

This evidence confirms the results of the regular surveys conducted by the Victorian Department of Employment, Education and Training. Since the surveys began in 1984 there has been a continuing trend in the concern expressed by young people about their future employment prospects. By 1988, their disquiet was unmistakable – 67 percent thought it would be very or fairly difficult to find a full-time job, and an overwhelming 92 percent saw it as fairly or very difficult to find an 'ideal' job. Their assessment was an astute one. By 1991, when the official unemployment rate in Australia for all age-groups was approaching the 10 percent mark, the unemployment rate for 15 – 19 year olds had already reached 26 percent – one in four was bound to miss out. Between 1990 and 1991 a further 130,000 jobs for young people had disappeared and by mid-1992 youth unemployment rates had reached 36 percent.

Thus, when we return to the evidence from within the survey, it is not surprising that, while 64 percent of the students said they themselves were troubled about getting a good job in the future, the response rate rose to 77 percent when they considered the fate of their age-group as a whole. Furthermore, the *consistency* of results which had characterised their overall responses to the questionnaire was even more noticeable as they identified the concerns confronting their own generation. The high response rate on most of the items left no doubt that they shared a high level of concern about the problems confronting their own generation (Table 5).

Chart 2: Priority Contrasts

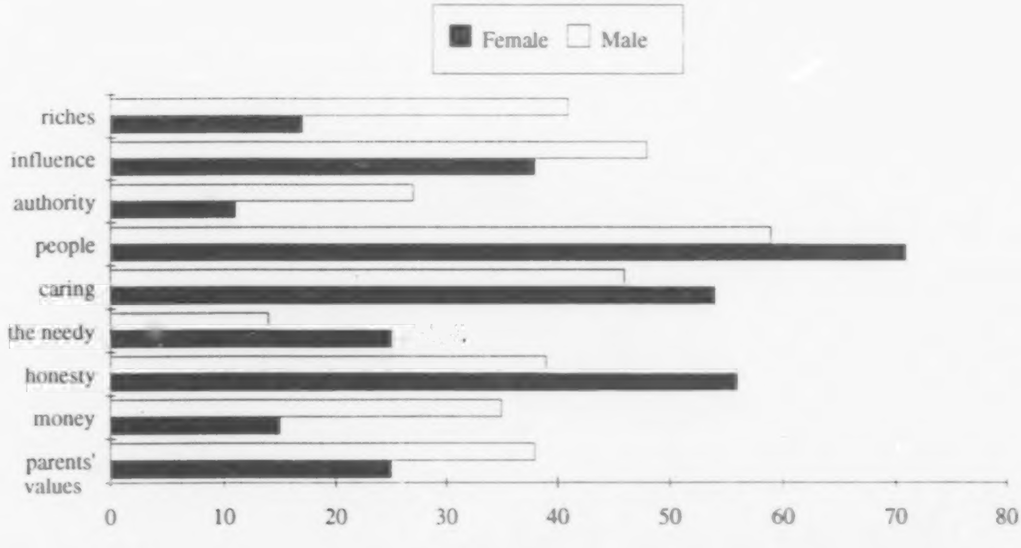


Chart 3: Main Youth Issues

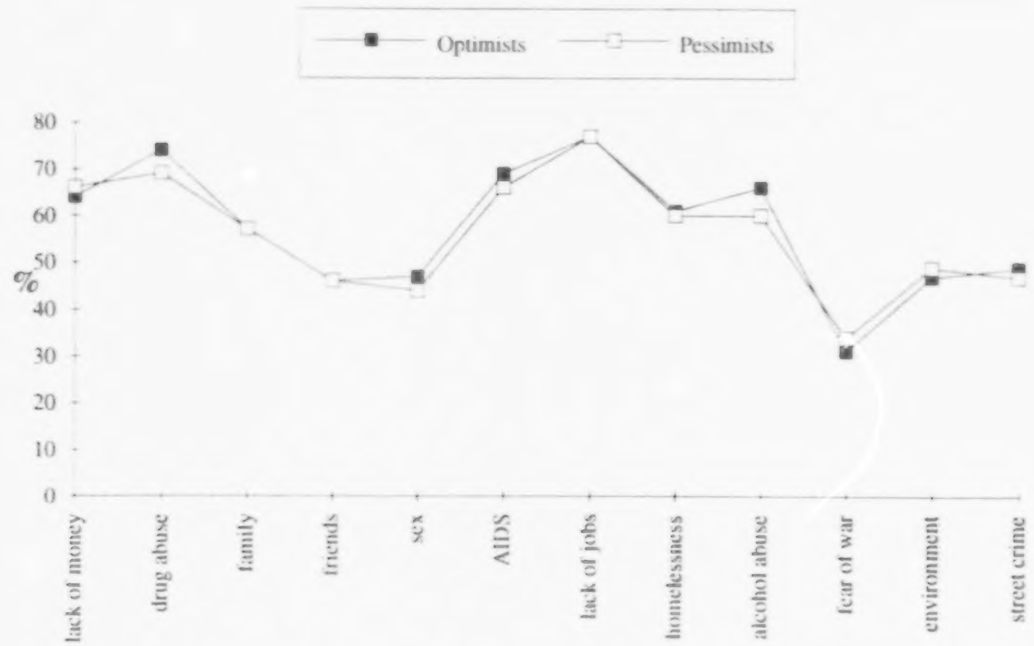


Table 5

	Score	Rank
lack of jobs	1842	1
drug abuse	1715	2
AIDS	1607	3
lack of money	1555	4
alcohol abuse	1510	5
homelessness	1448	6
family relationships	1366	7
concern over the environment	1154	8
fears over street crime	1150	9
personal relationships	1103	10
sexuality	1085	11
fears about war	779	12
other	110	13

This question on the main issues facing young people drew the most thoroughly consistent response of the whole survey. Not only were the optimists and the pessimists in agreement on what the main issues were, but they consistently agreed with each other (Chart 3). As might be expected the lack of jobs topped their concern. The almost perfect agreement between both groups carries a clear message which cannot be ignored.

The low rating for 'fear of war' suggests a decline of concern over this issue by comparison with previous studies. This appears to be a general Australian trend which is also reflected in the regular community attitude surveys conducted since 1984 by the Australian Department of Education and Training. The trend is understandable in the light of the cessation of 'cold war' politics and other changes that have occurred since the late 1980s at the superpower level. The high concern about drugs and AIDS is also understandable given the frequent coverage of these issues in the media and in health education programmes. Still the strong agreement between the optimists and pessimists about the lack of jobs was the most consistent top priority in every one of the seventeen schools. The 77 percent response rate on this issue clearly indicated a very high degree of shared concern.

Finally, it seems likely that the students are facing the future with a greater degree of foreboding than perhaps their parents and teachers realise. It would be true to say that the schools involved in the research had not envisaged that the issue of declining career prospects would emerge as the dominant consideration affecting the students' lives. It is perhaps hard for those who entered adult life fifteen or more years ago to realise how unsettling the collapse of the youth labour market and the concomitant pressures to remain on at school can be for the current generation of students. The family and school experiences of the students in this survey may well be more positive than those of others in their age-group but, in terms of the expectations about life that they have inherited from their parents' generation, they have all too much in common with their peers. As young Australians in the 1990s they face an uncertain future – *and they are aware of it.*

Notes

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The full report of this research is

Dwyer, P. (1991) *The Transition Factor: A Survey at Seventeen Schools*, Research Report No. 6, Youth Research Centre Melbourne. August.

For figures on divorce and family life see

Amato, P. (1987) *Children in Australian Families*. Sydney: Prentice Hall.

For discussion and research on what other less fortunate Australian children experience see

Holden, E. and Dwyer, P. (1992) *Making The Break – Leaving School Early*. Working Paper No. 8, Youth Research Centre, University of Melbourne.

For the 1988 disquiet amongst young people about jobs see

Australian National Opinion Polls (ANOP) (1988) *A Survey of Community Attitudes to Commonwealth Employment, Education and Training Programs*. AGPS, Canberra.

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item 12

set

number one 1993

EXAMINING CLASSROOM TALK

STRUCTURE AND TALK IN LITERACY LESSONS EXAMINED FROM A METACOGNITIVE PERSPECTIVE

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TWENTY-FIVE TEACHERS were video-taped in action, and later interviewed; for this ***set*** item I have chosen two teachers and two lessons as representative. Learning how to extract the main idea from a paragraph was the main objective in both. I was not interested in any problems or mishaps that happened in the teachers' work; my aim is to improve the teaching of literacy, not to criticise.

My method was to investigate the patterns of interaction and classroom talk in the classrooms of 9 and 10-year-olds. The teachers, all volunteer participants, selected one of their normal lessons which they felt was typical of their approach to teaching a new reading comprehension and research skill or strategy. After the videotaping the teachers were interviewed about the purposes of the lessons and their philosophy of literacy instruction. They were also asked to explain and demonstrate the strategies they themselves would use to complete the tasks they had been teaching in the lesson.

Analysing the Lessons

1. Phases a lesson goes through

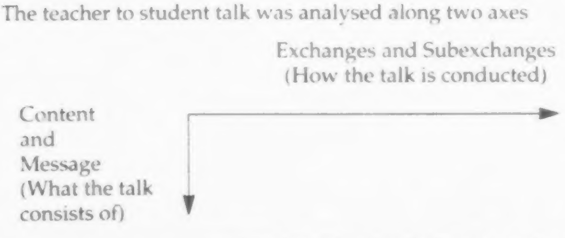
The videotapes were transcribed and the parts of the lessons identified. Drawing on work by Roger Shuy, you can think of a lesson as having four phases.

1. Attention – getting the student's attention and getting the lesson going.
2. Focus – where new information is given.
3. Process – where information about how to handle the new facts or skills is given – the metacognitive phrase.
4. Transition out – the winding up of the lesson.

My special concern is in the process section. How does classroom talk, instruction and discussion, help with the way new information is handled?

2. Teacher Talk

The teacher to student talk was analysed along two axes



The result is that the analysis examines both talk by the teacher and the nature of exchanges between teachers and their students.

My study sought to portray the spread of exchanges, from managerial to metacognitive. The categories became:

Management, where the organisation of the lesson occurs or general literacy information irrelevant to the objectives of the lesson is given. For example: 'Tidy your books'; 'Pencils down.'

Material Logistic where the focus is on the text or the task. For example: 'Alunak is excited because it is his first seal hunt'; 'What is the main idea in this paragraph?'

Cognitive Logistic where the focus is on the cognitive (how) aspect of doing the task (i.e., the skills and processes involved) and the utility (why) of these skills and processes. For example: 'You skim because you need an idea of whether the information is important or not'; 'Look at the pictures, they might help.'

In order to give more information about the nature and usefulness of the teachers' talk (as opposed to the exchanges between pupils and teacher) a further seven sub-categories were developed, which will be introduced and discussed in the Results section.

3. Teacher Interview Analysis

After interviewing the teachers I started the difficult task of seeing how words and actions match. I made a comparison of each teacher's philosophy as expressed in the interview and the philosophy reflected in the analysis of the lesson. Another comparison was between the information the teacher gave students and what the teacher in fact knew. This was particularly about the task (rather than the facts) because I was looking for the extent of the teachers' own metacognitive knowledge and awareness.

Results

Background

Both Mr S and Mrs T were experienced, well qualified and interested in improving their teaching. Both chose to use a piece of authentic non-fiction. Both used the strategy of (1) finding the main ideas, paragraph by paragraph, (2) having the students take notes, then, (3) generating a summary paragraph about the whole topic. However, neither identified this strategy, nor the aim, at the beginning of the lessons.

Table 2
Type of Teacher Talk Used by Two Teachers
(expressed as percentage of all teacher talk in the lesson)

	Management		Material Logistic			Cognitive Logistic	
Type of Talk	Classroom management	Literacy management	Reconstruction	Elaboration	Information	Process	Utility
Mrs T (302 exchanges)	18	48	27	1	6	0	0
Mr S (292 exchanges)	26	22	34	1	15	1	1

The Phasing of the lessons

Mrs T chose to guide the students through the entire sequence of skills before asking them to practice them. She went through, step by step, identifying the main idea, note-taking, and writing the summary paragraph before allowing the students to try them unguided.

Mr S broke down the task, introducing how to identify the main idea first, immediately followed by unguided practice of this skill. Then he introduced note-taking and followed that with unguided practice. However, he did not 'teach' the conversion of notes into a summary paragraph but just requested students do it, as an unguided phase in the lesson.

One can contemplate the ideal way of introducing a new skill. Perhaps breaking the task into its separate skills (as Mr S did) is more useful to students in an introductory lesson. Following teaching with immediate practice should reinforce knowledge. In Mrs T's lesson the first two-thirds was teacher led and the last third student led. Thus the students were passive for most of the lesson. Extended and unvaried roles for teacher and students would not seem to be conducive to maintaining attention and learning, but I do not have evidence on these questions.

Teacher Talk

In Table 2 is a summary of the teacher talk used in the two lessons.

Most of the exchanges, in both lessons, were about management – 'pencils down, read the first page' etc. Both lessons contained a reasonable number of Material Logistic exchanges – 'what is the main idea? What can you tell me about...? Usually the first sentence gives us the main idea.' However, most of those were of the *reconstruction* type, that is, re-doing the task, or simply rephrasing the text, rather than talking about the task. They placed an emphasis on the text rather than on the task – 'Rephrase the sentence in your own words,' is the most obvious case. Mr S used more *information* clauses, giving more information about the actual task. An example is Mr S saying 'Each paragraph has 3 main ideas.' Overall, Mr S engaged in talk more beneficial to his students than Mrs T, but neither lesson used a significant amount of task-related talk, explicit or implicit. Given that these lessons were of an introductory nature this is of some concern. One would expect an introductory lesson would need to contain more explicit task-related talk.

Interaction of Teacher Talk and Phases

1. Attention Phase

In the Attention phase there was little difference in the type of teacher talk, as would be expected in the general organisation of the beginning of a lesson.

2. Focus Phase

Both teachers told the children what the lesson would focus on. Mrs T followed this by defining terms; that is, giving information. However, Extract 1 below, reveals that the content of this teacher talk was rather confusing. This is some cause for concern since information talk comprised 44% of the teacher talk in this phase. The information talk was interspersed with instructions to write particular words in particular boxes on the page. There was no explanation as to the utility or purpose of this writing in boxes.

Extract 1: Mrs T's Information Clauses in *Focus Phase*

12T (a) Florence Nightingale
(moves back to front of room).
(b) Now, the first main idea *(holds up index finger)* the main thing we write down,
(c) the first main idea on our sheet is the person's name....
19T (d) Each paragraph has one main idea in it.
(e) It tells us,
(f) when you're trying to find out the information
(g) that it has one main idea in it.

In contrast, Mr S after telling the children the focus of the lesson, began with an exploration of the utility of paragraphs. Thus 13% of Mr S's talk in this phase was more than just information. Furthermore, the exploration of the utility of paragraphs was interactive (in contrast to Mrs T's non-interactive style) as students and teacher constructed knowledge together. This difference in interactive style can be seen by comparing Extracts 2 and 3 below. Note that Mr S concluded by reiterating the utility of paragraphs in the context of the text the students were about to read.

Extract 2: Typical Exchange in Mrs T's *Focus Phase*

12T (f) and because we're looking up something our list, the first thing we do
(g) is write down the person's name in the big box on our sheet *(Picks up sheet off student's desk and holds it up facing the class points to the box).*
(h) Florence Nightingale *(puts sheet back on student's desk).*
13S Where, Mrs T?
14S Which one, Mrs T?
15T *(Holds up sheet again and points)* Florence Nightingale. *(puts sheet back on students desk)*

Extract 3: Typical Interactive Exchange in Mr S's *Focus Phase*

1T (o) Why do we use paragraphs?

(p) Susan? *(To student with hand up).*

2S For the beginning the middle and the end, you use all different things.

3T (a) What's it about these different parts?

(b) What do you mean about different part, Susan?

4S When you go onto a different subject, or something; you use different paragraphs.

5T (a) Different subject

(b) or we could say? *(Nods to another student with hand up).*

6S Another meaning.

7T (a) Another meaning?

(b) No. *(Points to student with hand up)*

8S A different idea.

9T (a) A different idea. Isn't it?

(b) That's why

(c) we write in paragraphs.

(d) And on this sheet of paper here we've got

(e) first of all on this side that you have *(holding sheet up and pointing)* with the tube, the totem, there;

(f) this paragraph is about early civilizations in Mexico

(g) and each of the paragraphs will tell you something in a different way.

This analysis of the *Focus* phase reveals that although a teacher might be trying to give information, unless the grammatical structure is correct, the expression clear and the content correct, the information is not truly informative. It may in fact be quite the reverse!

It is to be expected that different teachers use the Focus phase of the lesson differently. However it is important that the Focus phase achieves its purpose: focussing not only on *what* the lesson is about but *why* it is important to know this. Mrs T identified the focus of the lesson and defined terms for use in the next phase. This is useful but serves no metacognitive function, nor requires any metacognitive behaviour of the students. Mr S, also identified the focus but followed with an exploration of the utility of the topic. It informed students about why the lesson focus was useful and may have enabled them to consider the utility of the learning to follow, that is, it may have encouraged metacognitive behaviour.

3. Process Phase (Guided Implementation)

There were several of these phases in each lesson, but these two extracts are typical of the type of talk which took place in them. The following two extracts emphasise the difference in talk in the two lessons. Extract 4 from Mrs T is a typical exchange, in which students were guided in finding the main idea in a paragraph. This sequence was repeated for each paragraph of the text.

Extract 4: Typical Exchange in Mrs T's *Guided Implementation Phase*

21T *(picks up sheet to read from it).*

(a) In that paragraph *(pointing in air with index finger)* what is the main idea? Steven?

22S She had many names and was a nurse.

23T You're on the right track.

24S *(Calling out)* She was a nurse.

25T (a) She was a nurse.

(b) She had some particular names

(c) but the most important thing was

(d) she was a nurse.

(e) So in the supporting ideas the first thing we write down

26S She was a nurse.

27T (a) is the one word,

(holds up one finger in air)

(b) seeing as we're only making a list of things, 'nurse'.

(Holding sheet and looking at it. Students write. Teacher stands at front of room and silently reads passage on sheet.)

(c) Read the second paragraph please Dinah.

Extract 5: Typical example of Mr S's talk in *Guided Implementation Phase*

19T (c) When we look at paragraphs

(d) usually the first sentence gives us the main idea of the paragraph.

(e) Right?

(f) It tells us what will follow.

Of interest in these two extracts is the fact that Mrs T used a question and answer exchange to 'teach' the students to find the main idea, although they had not been told **how** to find it, only the information that there is a main idea in a paragraph (imparted in the *Focus* phase). Therefore this exchange became a guessing game for the students rather than a teaching exchange. Mr S however, used an explanation to describe where to find the main idea, rather than a question exchange. When giving new information in an introductory lesson this would seem to be more appropriate.

Given the purpose and the introductory nature of the lesson I would have expected more Cognitive Logistic exchanges containing Process and Utility talk which emphasise the thinking processes involved in doing the task – finding a main idea is a cognitive rather than physical task.

4. Testing Phase

Although they occurred at different stages of the lesson both teachers used a 'testing' phase where students presented their work to the teacher and class. Both lessons used only Management talk and the lowest level of Material Logistic talk. They simply asked the students to read their paragraphs aloud and offered little comment except an acceptance or non-acceptance. No reasons were given for the acceptance or non-acceptance. Therefore students were not further informed about how to do this task.

Extract 6: Typical Exchange in Mrs T's *Testing Phase (Reporting)*

181T (b) aah Edward *(nodding to student with hand up)*.

182S *(Reads aloud while others listen.)*

Sir Henry Parkes was born in 1915 and died in 1986. Sir Henry Parkes was born in England. His parents weren't rich and he didn't have an education. In 1854 he was elected into the NSW Parliament. Sir Henry set up a newspaper.

183T (a) Right.

(b) You read out yours, Alison.

184S *(Reads aloud while others listen.)*

Sir Henry Parkes was born in England in 1815 and died in 1896.

185T (a) We'll have Sheryl.

(b) You read yours out.

Extract 7: Typical Exchange in Mr S's *Testing Phase (Reporting)*

(d) Alex *(nodding to student)*.

75S *(Reading)* I think it would be interesting to be an archaeologist. I could find out more about old cities. I could become famous for finding an ancient city. It would be enjoyable studying the ancient people.

76T Yes. Jaqui *(nodding to student)*.

77S *(Reading)* I think it would be interesting to be an archaeologist. Finding and looking for things that existed thousands of years ago. Discovering things that people think didn't exist would be fun. We would be able to compare back then to now.

78T (a) Yes.

(b) Somebody else?

(c) Toni *(to student with hand up)*, your thoughts.

Neither lesson used the testing phase to review the task and how it is done. Again, given the introductory nature of the lesson, it would seem this would be an ideal time to revise some of the previous teaching of the skills involved.

Summary

What the lessons accomplished

These two lessons show quite typical talk and exchanges. My other videotaped lessons are very similar. What conclusions can we draw from them?

Classroom talk contains very little teaching about metacognitive matters. The *how* of new skills is seldom broached; and very little metacognitive information is given to students; the examination of the thought processes involved in the task or the utility of the task is not encouraged. Even time spent on talk about the task and the text in front of them is mainly concerned with getting the task done rather than informing students about the task. One must question the usefulness of doing the task without learning *about* it and reflecting on its cognitive and utilitarian aspects.

What the lessons didn't accomplish

Why are lessons so concerned with getting the task done rather than with cognitive and utilitarian aspects? Perhaps teachers, like the rest of us, know very little about the cognitive and utilitarian aspects of the tasks/skills/processes they are teaching.

The teachers, in the last part of this study, were asked to explain how they would themselves complete the tasks. In fact very few could explain the cognitive aspects of the task. Their 'explanations' were usually very similar to the information they had given to the students which as has been shown, is not adequate. Many commented on how difficult it was to explain how they completed the task.

Most of us would find it difficult to explain how we find the main ideas in what we are reading. For example, most of us know the first sentence of a paragraph is not always reliable if we are looking for the main idea, and that the main idea selected is determined by the purpose for which we are reading. For example if we are looking for information about nursing we will select main ideas different from those selected by someone looking for information about Florence Nightingale's life. However, even if it is difficult, if we feel it is important to teach main idea (or anything else) we need to consider how best to explain it.

There was very little variation in the type of teacher talk in any of the phases. For example one would have expected that the type of teacher talk used in the *Attention* phase would be very different to that used in the *Testing* phase. Yet the talk in both was mainly at the *Management* level. As an observer, I would have expected, perhaps, enthusism and encouragement in the *Attention* phase and analysis and revision in the *Testing* phase.

Conclusions

It is possible that many teachers are not aware of the many phases that can occur in their lessons and the variety of purposes these phrases might serve. To think of lessons as being just 'arousal, instruction, conclusion' is too broad and non-specific. The role of teacher talk in phases is also significant. Some teachers may not be aware of the way they can vary their talk to suit the purpose of the phase in the lesson.

Such issues concern all subjects, not just literacy.

Notes

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This article draws on material in a doctoral thesis and can be found in more detailed form in

Anstey, Michele, *Examining Classroom Talk During Literacy Instruction from a Metacognitive Perspective*, a paper given to the 1991 Conference of the Australian Association for Research in Education.

Further reading upon this topic

Anstey, M. (1991) Examining Classroom Talk During Literacy Instruction: Developing Metacognitive Strategies, *Australian Journal of Reading*, Vol. 14, No. 2.

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item 13

set
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Wielding Power in the Classroom

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THERE IS GOOD POWER and there is bad power. No matter what your beliefs about wielding power, you cannot avoid using it in every social situation – in the home, at work, *and* in schools. It is used on you, and you use it on others. Yet power is neglected in education studies.

This is unfortunate because power can, when properly used, be a strong motivational factor. William Glasser is one of the main theorists on the problems of classroom discipline. In his recent book, *Control Theory in the Classroom,* he suggests that power is one of five basic human needs – to survive, to belong, to use power, to be free and make choices, and to have fun. He sees power as a fundamental need we all have, including children. For that reason, alone, it should be studied – especially by classroom teachers.

It is useful: (1) to look at the typical reactions people have when power is being used on them; (2) to identify and explain five commonly recognised types of power; (3) to caution against too heavy of a reliance upon some types of power while excluding others; and (4) to highlight how teachers can enhance the two strongest types of power – both of which often are overlooked in schools.

Reactions to the Use of Power

How do you feel when power is used on you? People of all ages, say 'I feel helpless,' 'I feel weak,' 'I get angry,' 'I want to strike back,' 'I wish to escape,' 'I feel defeated,' and 'I'll do it, but not because I want to'. Almost all responses are negative feelings.

We usually do not understand the nature of power, nor are we aware of the various forms power can take. Teachers are no exception, and we may inadvertently be over-using those forms of power that create negative feelings while, at the same time, overlooking forms of power that everyone feels positive about. (Despite one's first disbelief, there are indeed such forms of power.)

Types of Power

We can think of classroom teachers (and other leaders) having available five types of power.

1. Reward power – the teacher's control over rewards valued by students.
2. Coercive power – the teacher's control over punishments.
3. Legitimate power – the teacher's recognised authority to make certain kinds of requests.
4. Referent power – the teacher's ability to create a sense of oneness, common purpose, or identity with students.
5. Expert power – the teacher's task-relevant knowledge or skills as perceived by students.

This way of talking about power is thirty years old and is regularly cited in almost every discipline except education.

Reward, coercive, and legitimate powers are *positional* powers – you possess that power while you hold that position. It is a teacher's professional position that gives him or her control over (the school's) rewards and punishments, and the authority to prescribe student behaviour. These three power bases expect students, then, to listen to teachers because teachers can reward, because teachers can punish, or simply because they are teachers.

Referent power and expert power, on the other hand, are *personal* powers – the result of personality and skill. Students do what teachers ask them to do, often willingly, because they respect the teacher as a person. Given a choice among power bases (and one does have a choice), these two are the tactics teachers, as professionals, ought to be using.

When teachers use reward or coercive powers, they are trying to 'control' students' behaviour. When teachers use legitimate power, they are trying to 'manage' students' behaviour. And, finally, when teachers use referent or expert powers, they are trying to 'influence' students' behaviour. These three ways of wielding power in the classroom – controlling, managing, and influencing – are consistent with the views of Australian Ramon Lewis in his recent book, *The Discipline Dilemma.*

Negative feelings and, thus, negative reactions, can be expected from students when they perceive teachers trying to 'control' them. More positive feelings and, thus, more positive reactions, can be expected from students when they perceive teachers trying to 'influence' them.

The use of expert and referent power tends to result in commitment. The use of legitimate and reward power generally results in compliance, while the use of coercive power often results in resistance. These results, in more detail, are shown in Figure 1. The research that confirms that this is so, is spelt out in, for example, an article by Gary Yukl and Tom Taber, in the management journal *Personnel,* No. 602, pp. 37-44, and in the book, *Leadership in Organizations,* by Gary Yukl.

Figure 1

Outcomes that Result from Different Types of Power

Power Source	Commitment	Compliance	Resistance
Legitimate	Possible	Likely	Possible
Reward	Possible	Likely	Possible
Coercive	Unlikely	Possible	Likely
Expert	Likely	Possible	Possible
Referent	Likely	Possible	Possible

Returning to our initial questions:

> How do you feel when power is used on you? What kinds of feelings do you have when you perceive that others are attempting to 'control' your behaviour?

Are you committed to that behaviour? Hardly! Do you comply? Yes, if no other choice exists. Do you resist? Probably, if you can get away with it! Students feel the same way.

> What kinds of feelings do you have when you perceive that others are attempting to use their position to 'manage' your behaviour?

If you accept the belief that rank has its privileges (RHIP), then teachers may, within limits, tell students how to behave. As a student, will you be committed to the teacher's prescriptions? Possibly, if you judge the request to be appropriate. Would you comply with those prescriptions? Most likely. Would you resist the prescriptions? Possibly, if they are inappropriate and, definitely, if they are illegitimate.

> What kinds of feelings do you have when you perceive that others are attempting to 'influence' your behaviour (using referent power or expert power)?

In these cases the attempt is not resented unless the students perceive the 'expert' as arrogant or the 'referent' as taking advantage of their shared identity.

The Problems with Coercive, Reward, and Legitimate Powers

The first problem is that using such power bases can, at best, gain compliance and, at worst, can engender resistance.

These three power bases are deceptively attractive because they appear to be expedient. A quick verbal reprimand, promises of a high grade, or a reminder of who is in charge in the classroom, all can correct students' behaviour – at least for the moment. Teachers using these power bases slide into endless, as well as escalating, reprimands and rewards, and repeated reference to positional authority. These three power bases are like an electrical fire that is doused with water and appears, at first glance, to be extinguished. Moments later, usually when your back is turned, the fire is rekindled and once again must be handled. In addition, coercive and reward powers are effective only when student behaviour can be closely monitored in a way most busy teachers just do not have time for.

A second problem is that most teachers are ineffective wielders of these three types of power! Although our lives have been filled with role models – parents, teachers, clergy, military – who have used these power bases on us, few teachers have had formal training in the concepts, principles, and skills needed to use them effectively. Many of us end up using the three power bases as we, ourselves, have experienced them. Here, experience may *not* be the best teacher.

The first problem is inherent in the nature of the power bases themselves, the second lies in inadequate training. I mention these problems only as a caution. Rather, my objective is to encourage teachers to use referent power and expert power, instead.

Promoting Referent and Expert Power

Referent Power

Teachers who wield referent power get in return, from their students, feelings of personal affection, loyalty, and admiration. There is reciprocal identification, shared identity, perceived similarity of goals and interests, and a desire to imitate. These teachers are admired for their personal qualities; students want to act in a way that merits these teachers' respect.

John Sabol, my high school physics teacher wielded referent power. Because of him I decided to switch my career plans from pharmacy to physics teaching. He thought physics was interesting and exciting and, with him, I thought so, too. Physics turned out to be as exciting and as fulfilling as I expected.

I viewed Mr Sabol as a human being worth modelling. I respected him and wanted to act in a way that would, in a reciprocal manner, gain his respect. He had, and he conveyed, high (though reasonable) expectations of everyone in class, males and females, blacks and whites. He had no 'favourites,' not the pretty girls and not the jocks.

Most importantly, he was someone to whom you could talk when you had a teenage problem. Unlike most other teachers, rather than talk, give advice, suggest solutions, or moralise, he would just listen. He conveyed a faith and trust in our abilities to solve our own problems.

Students in Mr Sabol's class didn't listen to him because he could fail them (coercive power), nor because he could give them high grades (reward power), nor simply because he was the 'teacher' (legitimate power). We listened to him because we wanted to! He had influence, not simply control, over us.

He had referent power because of *how* he interacted with us. This is important: referent power can be learned and can be enhanced. Referent power is not simply charisma, something you are born with. Referent power flows from interactions, and we can all learn how to improve our relationships.

Expert Power

Teachers with expert power are respected for their competence and good judgment, are seen to possess valuable knowledge, information, or skills in relevant areas, and are sought out for their experience and abilities – they 'know what they are talking about!' Not surprisingly, Mr Sabol also possessed expert power.

Vocational and technical instructors often possess expert power. In Pennsylvania many 15-, 16- and 17-year-olds spend half the school year in their home academic high school and half the year at an Area Vocational Technical School (AVTS) studying a trade such as metal fabrication or cosmetology.

Many academic high school teachers are surprised, maybe shocked, to learn that students that cause them all kinds of problems in their classes are model students at the AVTS. I have researched the reasons why and found that AVTS instructors usually wield referent power and expert power, whereas academic high school teachers more often are seen by students to wield coercive, reward, and legitimate powers. Students recognise the 'relevant' knowledge and skills possessed by AVTS instructors. They also embrace the goals and interests of these adults, seeing in them the trades-persons they hope to be.

A clear example of expert power in my life is when I am sailing with friends on my 8m Ericson. It never ceases to amaze me that my 'crew' listens to me, apparently recognising my greater expertise in this area. Never is this more clear than in heavy weather when they literally jump, in response to my requests (orders).

Steps to Enhance Referent and Expert Powers

You do not have to be a John Sabol, an AVTS instructor, or a yacht captain in order to effectively wield referent and expert powers effectively. All power depends, ultimately, on the perceptions of those who are under the power. Therefore, influence how the children see you, and you influence what happens.

Students form their perceptions of a teacher's power by what the teacher does. What, then, should teachers do in order to heighten their referent and/or expert power?

To build referent power

Teachers should:

- ☐ Use more self-disclosure. Tell pupils how the concepts and principles in the course have impacted upon your life. This helps students see how they apply in their own lives. Thus a sense of common identity is developed.
- ☐ Associate with students in non-teaching ways, but keep it professional. Advise a club, coach a sport, participate in a run for charity; such activities give you and the students greater common experiences to draw upon later in class. At the same time, maintain a position of maturity, and do not act as a peer.
- ☐ Be fair in the attention you give to all students. Spend time in face-to-face positive interactions with all students, not just with the ones you feel are more 'ideal'. Too often the ideal students are those just like you.
- ☐ Be accepting, yet not patronising; recognise students' interests, yet avoid frequent tangents from the academic tasks at hand; show loyalty and trust, yet not at the expense of students' welfare.
- ☐ When disciplining, discipline the students' behaviour, not the student; there *is* a difference. Students may not know the difference, but they will feel the difference. Although many youngsters equate a criticism of their behaviour as criticism of them as human beings, disciplining in a calm and businesslike manner (not 'taking it personal') and disciplining with dignity (so you both save face) can help students differentiate between the two.
- ☐ Be aware of your tendency to have different expectations of different students. Get it under control. Research which has closely observed teachers shows that expectations can be triggered by such small things as the child's surname, given name, body build, or by more important things such as socio-economic status, race, gender, ethnic background and even by whether you taught the child's older brother or sister. Teachers are often unaware of how they treat children differently, yet the students note it clearly. Differential treatment *does* effect (or help fulfil) expectations – both good ones and bad ones.
- ☐ Read the book *Teacher Effectiveness Training* by Thomas Gordon. Begin using the skills of active listening when students let you know they have a problem; send I-Messages when you know *you* have a problem; try conflict resolution (working for a win/win solution) when you both acknowledge you share a problem. Better still, take a Teacher Effectiveness Training (TET) course. Don't let the 1974 publication date put you off. Unlike your bank card, Gordon's effectiveness training does not have an expiry date.
- ☐ Be a good role-model. Students are more likely to do as you do, not as you say – so do it right. A plus when you use referent power is that students want to 'get even' with you, doing unto you as you have done unto them, in order to earn your respect!

To build expert power

Teachers should:

- ☐ Demonstrate expertise by being thoroughly prepared. It is not possible to know all there is to know about any subject but be well-versed and be willing to say you do not know when you do not know.
- ☐ Practice what you preach. Education is a lifelong endeavour – it should not stop. As professionals, our expert power can be enhanced if we continue to take courses, and attend, as well as conduct, workshops, seminars, and in-service sessions. Let the students know you are keeping up-to-date.
- ☐ Be an informed consumer of the literature in your subject area *and* in your professional craft, pedagogy. Obviously, you see ***set***, so you are keeping up with pedagogical research. But do you, as a biologist, get *Nature* or some other scientific journal? As a historian, do you read new historical works? As an expert in English literature, do you keep up with overseas poetry? If you are keeping up, take care not to be intolerant of those less knowledgeable, nor be condescending towards those who try to tap your expertise.
- ☐ Where possible, teach students how to locate answers on their own. That builds independence; giving answers on a silver platter reinforces dependence. The greatest compliment to your expert power is when your student equals, or outshines you, the master.
- ☐ Tactfully, make students and parents aware of your formal education and professional accomplishments. Perhaps in the entrance foyer to the school some of the display cases full of sports trophies (evidence of student expertise) can be emptied and filled with evidence of teacher expertise – degrees, diplomas, awards. Unlike doctors and lawyers, teachers are too humble when it comes to revealing their expertise. Paper credentials do not guarantee good teaching, but they form expectations in the minds of others. It is then up to teachers to fulfil these expectations.
- ☐ Recognise student expertise, and incorporate it into class presentations, discussions, and work set. Knowing more about one's students (referent power) is the first step. Computer whiz kids are often well-known, but other children have other expertise based on travel, hobbies, sports and part-time jobs. True experts recognise *and utilise* the expertise of others.

Still other suggestions for building referent power and expert power are offered by Robert Benfari, Harry Wilkinson, and Charles Orth in the journal, *Business Horizons*.

Receiving, Rather than Wielding Power

Power, of course, is not something wielded by teachers alone. Administrators wield power, often influencing teacher satisfaction (or lack thereof) along the way. According to Abbey and Espósito, high job satisfaction goes with the use, by administrators, of referent and expert powers; low job satisfaction is related to the administrator's use of coercive power. An article by James Balderson, in *The Canadian Administrator*, confirms these conclusions. I found that most teachers say they do what an administrator asks of them because of the administrator's legitimate power. However, doing what you are told by the boss, because he (or she) is the boss, does not lead to teacher satisfaction, as Guditus and Zirkel discovered.

Conclusion

Power is an essential factor in social situations, including schools. Consistently superior results come from using some power bases rather than others. Failure to understand the nature of power often separates the successful from the less successful classroom teacher.

If we are only interested in getting students to behave, then the positional powers (reward, coercive, and legitimate) may suffice – but only momentarily. If, on the other hand, we are interested in more long-term changes (often those which need a change in attitude first), then the personal powers (referent and expert) should be used. This point is confirmed by Ronald Humphrey, Patrick O'Malley, and Lloyd Johnson in a recent *Social Psychology Quarterly* article. Teachers can develop their referent and expert powers by incorporating one or more of the steps described.

Notes

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> Tauber, Robert T. (1990). *Classroom Management from A to Z.* New York: Harcourt Brace Jovanovich.

and founding editor of the *Journal of Classroom Management*.

That the idea of power is neglected in educational studies is forcefully put in

> Nyberg, D. (1981). *Power Over Power.* Ithaca, NY: Cornell University Press.

William Glasser is a major theorist of classroom control and management. His theories can be found described in several ***set*** items, for example:

> Wilkins, Robert. (1987). A School Discipline Strategy, in ***set*** No. 1, 1987, item 15.

also

> Wilkins, Robert. (1983). Classroom Management, in *Best of **set** Discipline*, item 11 (1989) reprinted from ***set*** No. 2, 1983.

Glasser's book, mentioned in this item is

> Glasser, W. (1986). *Control Theory in the Classroom.* New York: Perennial Library.

The five types of power which classroom teachers (and other leaders) have were proposed in

> French, R. Jr. and Raven, B. (1960). The bases for social power. In D. Cartwright and A. Zander (Eds.), *Group Dynamics: Research and Theory.* New York: Harper and Row.

A further exposition of the personal powers derived from personality and skill can be found in

> Ellsworth, J., and Monahan, A. (1989). Empower yourself for better classroom management. *Instructor*, Vol. 49, No. 1, pp. 72-75.

The recent Australian book on discipline is

> Lewis, R. (1991). *The Discipline Dilemma.* Hawthorn, Victoria: Australian Council for Educational Research.

Figure 1 comes from

> Yukl, G., and Taber, T. (1983). The effective use of managerial power. *Personnel*, No. 602, pp. 37-44.

For a detailed discussion on the wielding of power, see

> Yukl, G. (1981). *Leadership in Organizations.* Sydney: Prentice-Hall.

The differences in how students see the power wielded by academic high school teachers and vocational technical school tutors is detailed in

> Tauber, R.T., and Knouse, S.B. (1985). The perceived effectiveness of French and Raven's five power bases for vocational high school teachers and students. *Journal of Industrial Teacher Education*, Vol. 22, No. 2, pp. 31-39.

Teacher Effectiveness Training (TET) is spelt out in

> Gordon, T. (1974). *Teacher Effectiveness Training.* New York: David McKay.

More suggestions for increasing referent power and expert power are found in

> Benfari, R.C., Wilkinson, H.E., and Orth, C.D. (1986). The effective use of Power. *Business Horizons*, Vol. 29, No. 3, pp. 12-16.

That high job satisfaction goes with referent and expert power can be found discussed in

> Abbey, D.E., and Esposito, J.P. (1985). Social support and principal leadership style: A means to reduce teachers stress. *Education*, Vol. 105, No. 3, pp. 327-332.

and

> Balderson, J.H. (1975). Principal power bases: Some observations. *The Canadian Administrator*, Vol. 14, No. 7, pp. 1-5.

My research showing that teachers do what administrators demand because of 'legitimate' power is in

> Tauber, R.T. (1986). Head teachers: Subjective and objective examinations of their social bases of power. *Secondary Heads Review*, Vol. 80, No. 248, pp. 1028-1034.

That doing what you are told does not lead to job satisfaction can be followed up, for example, in

> Guditus, C.W., and Zirkel, P.A. (1980). Bases of supervisory power among public school principals. *Administrator's Notebook*, Vol. 28, No. 4, pp. 1-4.

The fact that referent and expert powers change attitudes, not just behaviour, is discussed in

> Humphrey, R.H., O'Malley, P.M., and Johnston, L.D. (1988). Bases of power, facilitation effects, and attitudes and behaviour: Direct, indirect and interactive determinants of drug use. *Social Psychology Quarterly*, Vol. 51, No. 4, pp. 329-345.

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Going Back to School as an Adult

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Introduction

POLITICIANS, faced with increasing unemployment, have suggested that schools should be 'opened up' for the re-entry of adult students. Accepting adult students has also been heralded as a means of maintaining school rolls and so maximising the use of school sites. Cynics will suggest that here we see political expediency trying to disguise unemployment, and school Principals threatened with falling salaries (caused by falling rolls) looking for a quick fix.

The reality, whether advocates or cynics are right, is that increasing numbers of adults are looking at school re-entry as an option. Why do they choose school rather than other options? How have adult students found the return to school? What are the implications of this development for adult students, school-aged pupils, teachers, and schools?

To look into these questions I observed and talked with the 38 adult students in one New Zealand secondary school. I also asked them to compile diary accounts of their day-to-day experiences and so it became possible to gain insight into the complex and dynamic interplay of events which characterise the life of an adult student during a year at school.

First, however, the issues of why school? and why return? These questions are particularly appropriate in Australia where re-entry to secondary school is often dismissed as unlikely since there are similar courses at Technical and Further Education (TAFE) colleges.

Why school?

Advertising helps

As well as going back to ordinary school two other alternatives were available for adults seeking the same subjects, courses, and qualifications, namely 'Evening Classes' (at the secondary school) and Community College. Indeed, several of these adults had experienced both. Yet, all saw returning to school, either part-time or full-time, as the preferred option. The reasons were two-fold, and to some extent interrelated.

First, **time**, and its corollary, **convenience**. For the adult students, a return to school meant qualifications in a shorter period of time than through the alternatives. For instance, a four subject University Entrance (UE) could be completed in one year full-time at school but a minimum of two at Evening School. Similarly, returning to school was more convenient in that classes were 9-3, the same as, in some cases, their own school-aged children.

The second group of reasons were more difficult to define, being related to the context and clientele of the school. The adult students got greater satisfaction from the mixing-of-ages at school than from the adults-only alternatives; 'fun', 'new ideas', 'enthusiasm of youth', 'greater variety of ideas', were mentioned. Certainly, there was a total rejection (by adult students, teachers, and school-aged pupils) of any suggestion for adult-only classes. Teachers being more available at school (than at either evening classes or Community Colleges) was mentioned and more opportunity for discussing work with staff, students, and school-aged pupils.

The overall support for returning to school, rather than the alternatives, was very strong and the participants considered this the best option. Yet awareness of this option was not widespread within the community. This school relied primarily upon word-of-mouth, but another, close by, advertised vigorously using mail, the media, and an Open Day for adult students. This resulted in considerable community awareness of the programme.

Why return?

Multiple reasons, multiple outcomes

I found complex and multifaceted justifications, highly individualised. Each student had their own cultural and home background, their own expectations, present home situation, employment, financial situation, and social activities. They also had predispositions and expectations from their prior experience of school. While for all students the decision to return represented somewhat of a hurdle to overcome, the longer the period since school and the more negative they felt about their schooling, the longer the decision-making processes took. F.30 provides a typical example. She wrote:

> a.m. My first day back at school after an absence of 16 years. My initial terror gave way to feelings of enthusiasm and 'why did I leave it so long?' I could have done this three years ago had I found the courage and a little more motivation. I am delighted with my teachers, feel sure they will keep me interested and help me when I need it.

Reasons for returning start with a desire for further learning and the pursuit of credentials, often to enable a change of occupation. These adult students sought School Certificate (SC) and University Entrance (UE), but most commonly as an initial step towards further study and credentials.

Many of the adult students gave at least equal prominence, if not more so, to other, personal, outcomes:

> I don't think UE was the main issue – I think the most important thing this year was deciding what I wanted to do. (F.16)

These personal goals were seen by some students as more important and of more benefit than credential-based goals:

> It got me away from the 'suburban neuroses' thing. It's been really, really good as far as the family is concerned... now, they've got that bit of independence and I don't tend to fuss over them. .... I'm more self-assured. .... I feel I can go out and get a job, I know I'm capable of doing something if I want to do it. So, it's given me confidence. Yeah – its been good – even if I didn't get UE, it's been really worthwhile. (F.30)

Occupational mobility, status mobility and personal factors were therefore of at least equal importance.

Integration effects

Emphasise the familiar, encourage integration

The adult students arrived at school with certain predispositions based upon their earlier experiences at school.

> ...school never changes – it's always the same. I roughly knew what to expect, so, physically, it's not a lot different really. (M.17)

One aspect assisted their integration into the school – this was a school where senior pupils did not wear uniform. In Australia school uniform is almost an 'institution' from primary levels on; in New Zealand very few secondary schools insist on 16- and 17-year-olds wearing uniform. These adult students noted that similarity of dress greatly assisted them in feeling comfortable and part of the school culture. Some of them said that had there been uniform – both for the pupils and certainly for adult students – they would not have returned to school.

Part of the class, but different

The processes of integration were also influenced by the Dean and classroom teachers. The Dean sought to place adult students in senior classes reflecting a general perception among the staff that pupils at this level were most similar to adult students. In the classroom the teachers gave emphasis to appropriate roles, that of teacher/student rather than adult/adult. The adult students responded by adopting strategies to comply:

> ...for instance, in Economics, it's far easier for me to get along with everybody – teacher and pupils – by acting more as a pupil – more as a kid, than as an adult. .... I just act like they do. (M.15)

In both interviews and casual conversation the adult students always referred to their teachers by title and surname, even in instances where the student and teacher had social contacts outside the school. Even the teachers commented on this, it was formal, and they had not expected it from adult students, particularly out of class. The adult students, however, saw it as a legitimate component of student/teacher relationships:

> I don't like to get too friendly with the teachers because you feel then that you can't have a pupil/teacher relationship. .... if you get too friendly with them, they feel stink if they have to criticise you – when your work's not up to standard or you're doing something wrong. That's important, I think, because you've got to know if you're doing the right thing. (F.11)

However, this is not to suggest that the role of pupil was accepted without qualification or, indeed, some resistance:

> Also, she [TF.11] treated us like kids – me and M.5. .... She was worse with M.5 – she sort of told him off, just to get a laugh from the class. .... She would sort of tell him off then look at the class for their approval. .... Some of the class would sort of snigger – most of them, though, didn't pay it any attention. But, I felt, she was always trying to bring us down – make us out to be pupils, rather than adult students. (F.16)

In such situations, then, the adult students are the same as their school-aged peers. They are idiosyncratic, and respond as individuals, a point of which the majority of teachers are well aware. However, there were sufficient instances to suggest that greater recognition should be given to the independence and maturity of the adult students. While they appreciate being treated in similar ways to the pupils, being in any manner demeaned will be resisted. One adult categorically rejected, and drew to the teachers attention, incidents of sexism and anti-Gay 'jokes'.

Career counselling, personal counselling

A further area of concern is access to information and advice. Even at the point of enrolment, it was clearly evident that few of the adult students had any great knowledge of subject content, the relationship of content to career paths, or even the available career options:

> Found on enrolment one has to be knowledgeable on subjects available for University Entrance. Information not forthcoming until one persisted in requesting advice. (F.24)

Accordingly, schools must provide such information and the appropriate career advice, rather than assume access or prior knowledge. However, there is a further form of information many of the adult students felt was required. This can be broadly categorised as counselling – 'I found I was someone for them to talk to' – and indeed most commented on this. Although such tasks were part of the Dean's job, she reported that while I was there she spent less time talking with the adult students. The adult students, like the school-age pupils, need someone else to talk with about career and personal issues.

Getting information through

Adult students often found themselves unaware of school-based events, including sports visits, timetable changes, meetings, cultural events, and so on. Generally, this came about because they were not required to attend school assemblies, and some said they were part-time.

Also many of the teachers said they did not know enough about the adult students, including career intentions, difficulties being experienced, prior knowledge, the external commitments (and a variety of other information) that might have been useful. What appeared to be lacking, was an effective means of disseminating and exchanging relevant information.

Subject options and class levels

There was some lack of awareness among staff about various requirements, particularly for entry to university. Furthermore, some adult students were directed towards the humanities, in contradiction to their chosen career paths. For instance, F.10 seeking entry to nursing studies was enrolled in English, history and geography, and only one science, biology.

Some teachers noted that certain adult students experienced difficulties in mathematics and physical sciences due to a lack of background. However F.11, who had achieved high levels of examination success (marks in the 70's and 80's in school examinations) at Fifth Form level was placed in the Fifth Form again. This was said to be because she had been out of formal schooling for some time, yet F.23 who had been a pupil the previous year was enrolled at sixth Form level from which she achieved only 23 percent in Mathematics and 5 percent in English in University Entrance.

In short, an assessment of the adult student should occur, examining experiences, abilities, and proposed career directions. The practice of assuming that certain curriculum areas and levels are more 'appropriate' for adult students is not good enough. Greater access to a variety of knowledge, and to career paths is imperative.

Time to do a good job

The teaching and curriculum decisions by teachers for these adult students were entirely based upon prior experience rather than on particular knowledge or a theoretical basis. The training of the teachers had not involved any mention of adult students. Indeed, some staff were unaware until their first class that adult students were enrolled in the school. The adult students disliked being treated as kids. I did not observe teachers in class but it seems sensible that teacher education should incorporate awareness of what adult students need and their perceptions of how they are treated.

One aspect of considerable concern to teachers, however, was clearly evident within the research. This was the point that adult students were more demanding on time than their school-aged peers. At both the classroom teacher and Dean level, all commented upon the considerable time they spent out of class talking with, and assisting, the adult students, often to the extent of taking up entire lunch periods, after school, and non-contact times. In particular, it would be appropriate that the Dean, with overall responsibility for adult students, should be readily available; in this school she had a full teaching load, and other commitments.

Age and status

The adult students established their own subculture; they interacted and negotiated with others to establish a set of clearly different roles, rights, obligations, intentions and actions. Generalised guidelines from the Department of Education said that an adult student was one 'aged 18 years or over, with at least one full year of outside school experience'. However the interpretation is the responsibility of the particular school, and the school I was at had admitted a 16-year-old only a few weeks after leaving. This brought problems. A majority of the adult students expressed considerable criticism of M.16 being admitted. Along with problems about his age, he chain smoked, stubbed cigarettes on the arms of the sofa, rode his motorbike in the Commonroom, and swore. While his behaviour got better during the year, his peers, teachers, and the Dean continued to refer to M.16 as 'not a true adult student'. He maintained, sometimes with particular emphasis, his claim to adult student status.

On the other hand, M.6 (aged 19) was regarded by staff and students as an adult student, yet reported feeling 'more at home' among the pupils with whom he also associated during out-of-class time. Becoming an adult student is not merely being given the status, but requires a process of self-identification.

Attendance: flexible, inflexible?

Perhaps it was the issue of attendance which most clearly demonstrated that the adult student was a person with a different status and subject to different expectations, treatments, rules, and regulations. As one teacher commented:

> Most of the pupils at my fifth form level realise there are certain people around the school, who are there under special circumstances and aren't subject to the same forms of discipline or the same requirements of attendance. It's not really me that has to accept it – it's the rest of the class – and they seem to accept it very well. (TM.16)

This was rationalised by the staff on the basis of the external commitments – family, job, home – held by the adult student and not the pupils. However, it must be noted that this was teacher dependant, and teachers were actually bending the law about external examination attendance requirements. For the adult students, this freedom from attendance regulations was important:

> You haven't got the rules to get at you like when you were a pupil. You don't have to come if you don't want to. You only let yourself down if you don't come. You don't get teachers on your back – the kids do – they get nagged to go to class, you just do what you want to do. Put it this way, I wouldn't have come back if we'd had the same rules as the kids do. (M.5)

The outcome of this freedom was many different attendance patterns: three adults maintained almost regular attendance, others were absent for as much as half the time. Similarly, a range of reasons were given for absences, including family or work commitments, not having completed assignments, 'couldn't be bothered going', holidays, watching television Soaps, weather, and many others. Each adult student determined for him or herself an acceptable-level-of-attendance which was their compromise between their ongoing lives and commitments and their pursuit of both credential and personal goals. In short, adult students did not see school as the central component of their lives:

> It's important that study is only part of my life and not the whole of it. (F.32)

I would recommend this flexibility and self regulation to all schools with adult pupils.

Timetables

While the adult students recognised the exigencies of timetabling, and the occasional need for change, a regularity of times becomes very important to them and allows them to schedule their commitments more effectively. There were instances where timetable changes were not communicated to the adult students, or where they could not reschedule their commitments. The result was absences from class. Although they vented their ire over such instances, they were lucky that there was at least an overall continuity and regularity.

However, the school proposed to implement a rotating six-day week timetable in the following year. This change was strongly resisted by the Dean who felt benefits for senior staff were outweighed by the disadvantage to adult students (and indeed school-aged pupils). Adult students need to plan ahead for family, work, and other commitments. A school with adult students must maintain timetable continuity and regularity.

Financial assistance

Staff and pupils were fully aware that these adult students had a variety of external commitments which brought about attendance problems. Often their financial situation meant they had to undertake part-time work in order to support themselves at school. The need varied, depending upon age and marital status. Some had given up the Unemployment Benefit to return, others had forsaken income sources, family income was reduced, and for some the feeling of independence was a factor in deciding to drop out.

Although full financial support for adult students had been advocated in New Zealand none had been forthcoming. The only finance, available only to those with no other source of support, was $6 per week for those aged 18 to 20, increasing to $27 per week above 20. (This, in 1993, has been considerable increased, about equal to the dole.)

Many of the adult students felt that better financial support was justified. For some the alternative to school was to remain on the Unemployment Benefit and be a greater burden to the State. All of them were seeking to improve their credentials, and therefore employment prospects, in much the same way as students at university. They suggested that some form of financial assistance, even if progress-dependant, would be of benefit. Citing M.16 as an example, however, they did suggest that financial support required definite age limits.

A Commonroom

Classroom interaction with ordinary pupils was considered important and beneficial. However, outside classes there was little integration. An adults-only commonroom was part of the reason, but considered essential.

> You need to get away with your own friends – people of your own age group. Adult students, really, are on a different level to the pupils. They have experienced what it's like outside school and they have conversations about things – like, even about the teachers – which I don't think the pupils would understand – they might take the wrong meaning from some of the things said about the teachers. So, no – they shouldn't share the same Commonroom. (M.15)

This room not only provided a 'back room' for adult/adult interaction, but also a place to do homework – particularly useful for those with families where homework facilities were limited or restricted to late at night. The usefulness of this adults-only commonroom was illustrated when I compared the situation at another school where the Commonroom was shared between adult students and senior pupils. The majority of the adults said 'I never went there'. Noise and lack of privacy were the reasons.

Child-care

Related to their financial circumstances, as an additional expense to some, was child care. Some schools in New Zealand possess creches, but not the school I was studying. A creche not only opens up wider access to the school for adult students but is a useful learning resource for school-aged pupils. This was confirmed at a school with a creche which I visited briefly. There the creche was cited as a major factor in allowing adult students to return to school. Indeed, at both schools, staff and adult students strongly supported the notion that a creche should be available for both main reasons.

Full consideration should be given to establishing an integrated child-care facility as part of any secondary school which will attract adult students.

Discussion

Becoming an adult student is not merely a matter of turning up and being put with school-aged pupils. While similarities exist between the two groups, adult students are different, and remain so. Policy and practice must recognise both their experiences and background.

What we need, if our countries are seriously committed to life-long learning and access to knowledge and career paths, are better programmes and situations for adult students to help them as they re-enter school.

Notes

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This paper, with recommendations more fully spelt out, was first presented to the 1991 conference of the Australian Association for Research in Education.

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The New Zealand adult students were questioned in 1984. Since then the financial support has increased considerably, for example (1993) a single 17-year-old can get NZ$109 per week if living away from home, someone over 25, $131. There are still means tests but also further supplements for dependent children, spouse, etc.

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item 15

set
number one 1993

Students-at-risk:

IDENTIFICATION AND INTERVENTION

A CASE STUDY

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and
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WHY DO SOME STUDENTS drop out of school early? What can be done to identify these students in advance and to prevent their premature departure from school? This *set* item reports on the approach taken by one Queensland high school to address the problem.

1. Introduction

High school students are staying at school in much larger numbers nowadays. Retention rates in Australian high schools increased from 34.5 percent in 1980 to 64.0 percent in 1990. In Queensland, approximately 70 percent of students remain at school until Year 12 (NZ Form 7) nowadays. The federal government's drive towards higher school retention rates includes the Students-at-Risk (STAR) programme. This programme aims to identify those students in government schools most at risk of not completing secondary schooling and to encourage their continued participation by supporting a range of school-based projects. Schools with low retention rates are given priority.

One school identified for STAR funding in 1990-91 was Keebra Park High School, a co-educational state high school for students in Years 8 to 12 (Form 3 to 7). Established in 1973, the school grew to a peak population of approximately 1600 students, before declining to a size of 544 students in 1990 and 640 students in 1991. The school is located on Queensland's Gold Coast, approximately three kilometres south-west of the Southport business district. Thirty-eight teachers worked at Keebra Park in 1990, 41 in 1991. Students in Years 11 and 12 (Forms 6 and 7) at the school study English plus five other subjects from a list of over 30 academic and vocational subjects.

The school was selected for STAR funding because it had a Year 10 to Year 12 retention rate of 50 percent, compared to an average rate of almost 70 percent in neighbouring schools. The school then had to choose specific projects. It was decided to carry out in 1990 a research project investigating issues of student satisfaction, performance and retention.

2. The 1990 KPHS STAR Research Project (September – November, 1990)

The research questions:

- ❑ How many of the students at Keebra Park are at risk of leaving school before completing Year 12?
- ❑ What characterizes these students at risk?
- ❑ What factors influence their decision to leave school early?
- ❑ Can these students be identified in advance?
- ❑ What can be done to prevent their unnecessary departure from school prior to completing Year 12?

Information and opinions were collected from 384 current students, 14 past students, 102 parents and 31 teachers at Keebra Park. The data were obtained using self-administered questionnaires and face-to-face interviews. School records were consulted.

Satisfaction

- ❑ The majority (72 percent) of students were moderately or extremely satisfied with the school.
- ❑ Viewed most favourably were the school's small size, its friendly teacher-pupil relationships and its sporting programme.
- ❑ No aspect of the school got consistent negative comment.
- ❑ Comparatively low levels of satisfaction were apparent in the following sub-groups of students: those with lower (self-rated) abilities and self-esteem, those who were not involved with the life of the school, those with few friends, those who did not intend to complete Year 12, those from non-English speaking backgrounds, those who placed low values on staying at school and on doing their best at school, and those in Years 9 and 10.

Academic performance

- Keebra Park has academically 'average' pupils.
- Poorer academic records were disproportionately concentrated among those whose parents were less highly educated, those whose fathers worked in 'blue-collar' jobs, E.S.L. students, students who perceived their parents to have low educational aspirations for them, and students with low abilities and self-esteem.

Retention

- The majority (87 percent) of Year 9-11 students intended to stay at school to complete Year 12.
- Students who intended to leave, when compared with those intending to complete Year 12, dislike school to a greater extent, perceive their parents to be less supportive of their continued education, and express a number of other distinctive attitudes. The two groups were not, however, distinguishable on the basis of gender, ethnicity, family type, or other demographic factors.

Important factors

'Stayers' believed their parents viewed staying at school as important and their parents had tertiary aspirations for them. They themselves were more likely than 'leavers' to aspire to tertiary education and a professional career, and were two- to three-times more likely to believe that staying at school not only would improve their job prospects, but also would be an enjoyable experience in itself. They rated themselves above average for verbal ability, maths and general academic ability; they also said they had high self-esteem. They reported a high level of involvement in the life of school.

The Year 7 *Test of Learning Ability* (TOLA) mean score for the stayers was 8.12, compared to a mean score of 5.68 for the leavers. Intending leavers were not only performing worse academically but the difference was widening with each passing school term.

Initiatives

The study also identified a number of school-based initiatives which were considered likely to help increase student retention rates. The following six were widely supported by students and teachers alike:

- broadening the academic curriculum
- extending the programme of practical subjects
- increasing opportunities to be involved in work experience and part-time study
- removing restrictions upon subject choice caused by time-tabling inflexibility
- increasing the use of experiential/hands-on teaching methods, and
- providing more support for students who are struggling academically.

To even start on this list was beyond the funds available. So the 1991 STAR grant was used to employ a STAR support person for counselling, skill-building and support activities with students who were identified as being at-risk. (Such is the fate of much research – the people who hold the purse strings initiate something not recommended by the research.)

3. Development (April, 1991)

After the publication and dissemination of the research report in February-March 1991, it was decided that the research component of the project should be continued. In particular, gathering statistical information about the 1991 Year 9s was thought important to make comparisons with the 1990 cohort and to look for trends. In addition, in line with the guidelines of the STAR programme, a strategy for the early identification of at-risk students was required.

The school was looking for a way to divide Year 9 students into two groups:

- those needing STAR support. (They would include, for example, students who stated an intention to leave school, but who appeared to have the ability and the home support to continue, and those students who stated an intention to stay but who had a number of risk factors which might contribute to an early departure), and
- those not needing STAR support.

To identify at-risk students we needed three kinds of information:

1. the students' intentions about when they would leave;
2. the students' perceptions, attitudes, values and goals, with particular reference to those factors most likely to discriminate between stayers and leavers;
3. reports of academic performance and classroom behaviour.

A screening questionnaire was developed using those items from the 1990 questionnaire which distinguished intending stayers and leavers. It asked about

- family support for continued study
- academic self-concept
- academic attitudes and values including attitudes to school, to staying at school and to education
- academic performance
- career preferences
- intention to leave or stay, and reasons for this choice.

4. Identification of the Students-at-Risk (April-July, 1991)

All 122 Year 9 students completed the questionnaire. Fifteen clearly fell into the at-risk category with approximately 30 others showing up in three areas of concern. Discussion with the school administration and Year 9 teachers, resulted in a total pool of 50 possible students-at-risk.

All 50 students were individually interviewed by the STAR-support person. This interview focused particularly upon the students' responses to the items on the screening questionnaire. Then we had

- 24 students-at-risk (including all 15 identified through the screening instrument),
- 26 others.

The 24 students-at-risk were given a second interview, during which they were shown an outline of the proposed STAR intervention programme (entitled *Future Bound*), and were invited to participate. Consent was sought from parents.

Twelve males and 10 females agreed to participate in the *Future Bound* programme. One student declined because he was leaving the district; the other student's parents believed the programme was inappropriate because the student intended to leave school soon in order to enter the family business. The *Future Bound* programme was then developed and begun.

5. Characteristics of the Students-at-Risk

The twenty-four students at-risk responded to the items on the screening questionnaire in a manner which was strikingly different from the others. Several of the most important of these differences are summarized in Table 1. As can be seen from this table, compared to the students not at-risk, the at-risk students received considerably less parental support for their studies, perceived themselves as less able scholastically, and enjoyed school less. In addition to being disaffected by their experience of school, they had unrealistic and less specific career directions in mind.

Table 1

Comparison of At-Risk and Not At-Risk Year 9 Students

Characteristic	% of Students At-Risk (n=24)	% of Students Not At-Risk (n=98)
Parental Support:		
Currently live with only one parent	46	15
Get along 'very well' with parent(s)	17	54
Discuss school 'most days' with parent(s)	38	69
Parent(s) think it is 'extremely important' to complete Year 12	17	55
Believe it is very important to do as parent(s) think is best	30	72
Academic Self-Concept:		
(Self-Ratings)		
Above average verbal ability	29	65
Above average maths ability	13	57
Above average academic ability	21	63
Above average sporting ability	50	71
High self-esteem	29	84
Academic Attitudes and Values:		
Above average level of involvement in the life of the school	13	55
Think school is better than 'OK'	42	79
Believe staying at school will 'greatly improve' chances of obtaining a good job	42	88
Believe staying at school would be enjoyable	13	78
Believe it is very important to do one's best at school	50	91
Career:		
Intend to enter a profession	17	57
Intend to work in a sporting or recreational role	26	7

6. The 1991 STAR Intervention Programme: *Future Bound*

The *Future Bound* intervention ran at the school over a thirteen week period from August 19th until November 29th. The programme was conducted entirely by the STAR support person (the SP) who was on 0.6 time (Monday, Thursdays and Fridays). The programme had two formal parts:

(1) group interaction workshops;
(2) 30 minute individual interview /counselling sessions when needed,

plus informal visits by the SP to the students' classes, chance meetings and students dropping into the SP's office.

For the workshops the 22 students were divided into four single-sex groups based upon

(a) similarity of the students' problems and concerns,
(b) recommendations from staff about who would work best together.

Each group of students was withdrawn from class once a week for a single, double and, occasionally, a triple period. The total time was twenty-three 35-minute periods, (13.5 hours) plus a full day's outing in the final week.

The major aims of the programme were

(a) to encourage students to think through their decision to leave school early more carefully;
(b) to enhance students' self-esteem, social skills and other personal qualities, and their knowledge about careers;
(c) to encourage students to take greater responsibility for themselves and their future.

Programme content was drawn from a broad array of sources and was organized to proceed from personal to occupational issues. Specific elements of the programme included:

- ☐ group building activities
- ☐ values clarification exercises
- ☐ listening and other communication skill-building activities
- ☐ training in assertiveness, and impulse control
- ☐ career exploration and clarification tasks.

The final session involved a field trip to the local Careers Reference Centre. All four groups had the same programme.

Teaching methods were primarily experiential and interactive, with minimal use made of teacher-centred instruction. The SP attempted to strike a balance between a rewarding and accepting style, on the one hand, and a style which included frequent use of direct and constructive confrontation, on the other.

7. Evaluation of the programme (December 1991)

The Future Bound programme was evaluated in five ways.

1. *Students' Evaluations*

The first component was a questionnaire completed anonymously. In general, this feedback was very positive. The students identified two major areas in which they had benefited: personal (for example, improved ability to express feelings, improved relations with family) and school- or work-related (for example, increased job knowledge, increased confidence regarding job prospects, greater willingness to remain at school, increased motivation to succeed).

Half of the students believed that the programme should have run for a longer period of time. Several suggested that more access should have been provided to past students who had left school early. Additional topics suggested for inclusion were drug and alcohol abuse, sex education, interpersonal relationships, skills for coping with unemployment and rejection, and interview training. The great majority of the students believed that the programme had helped them learn about themselves, had improved their communication skills and assisted their planning for the future. Most indicated a willingness to be involved in helping others who were contemplating leaving school early.

2. *Parent Evaluations*

The second part of the evaluation was a questionnaire sent to the students' parents, asking them to report upon their children's views of the programme, and upon any changes in their children's school-related attitudes or behaviour over the duration of the programme. Only seven of the parents returned their questionnaire. Responses were, however, very encouraging. The most positive response came from a parent who remarked that his/her daughter had apparently 'grown up overnight', and that her attitude 'to schoolwork, home duties and, more importantly, her future had improved out of sight'.

There was, furthermore, evidence that the programme had made the parents more appreciative of the school in general. Comments such as 'Thank you for your support and guidance', suggest that closer parent-school relationships may have been fostered. Of course, the poor response rate must leave open the question whether the favourable attitudes of some were shared by those parents who did not return their questionnaire.

3. *Teacher Evaluation*

The third component was a questionnaire completed by the teachers asking them to rate the students on eleven dimensions such as self-confidence, co-operation in class, completion of homework and so on. In general, the teachers perceived only a slight improvement in the skills, attitudes and the behaviour of the Future Bound students. More specifically, in the teachers' eyes two of the participants improved substantially; eight showed improvements in some areas, for some teachers; and the remainder showed few signs of improved attitudes or behaviour. Amongst the most favourable comments was the following assessment of one student: 'she now shows pride in her work, in her appearance, and has made big improvements in her relationships with students and myself as teacher'.

4. *Examination of the School Records*

The evaluation also included a comparison of the Future Bound students and another group of non-participating students (controls) based upon information from school records of academic grades, attendance and classroom behaviour. Both groups of students showed little change on these measures, with the at-risk group performing less favourably than the controls, both before and after the programme. In other words, the 'gap' between the groups did not close during the programme.

5. *Follow-up Questionnaire*

The final part of the evaluation was a modified version of the original screening questionnaire, completed by all Year 9 students in the last week of the school year. Questions asked about:

academic self-concept
attitudes to school
academic values
attitudes to leaving school
career intentions.

Responses to this questionnaire permitted a comparison of the 'change-scores' of participants and non-participants in the programme. There was little evidence from their responses that the Future Bound students' attitudes had improved. This stability of attitudes did, however, occur in a context where the majority of their peers' attitudes became less positive over the duration of the year. In other words, the gap between the 'at-risk' and other students narrowed – an outcome which may not have occurred without the Future Bound programme.

8. Conclusions

At Keebra Park High School on Queensland's Gold Coast, a systematic attempt has been made to identify at-risk students and to enhance their self-concepts, social skills and sense of responsibility for their own future. The thirteen week intervention programme was evaluated in five ways, with mixed results. The programme was well received and appeared to produce changes for the better in some students' attitudes and behaviour, both at-home and in the classroom; but it failed to effect immediate gains in the students' academic performance, school attendance, attitudes to school or intentions to complete senior schooling.

Overall, this brief school-based intervention has had moderate success. More substantial improvements are likely to occur if such programmes are implemented in contexts where schools and education authorities demonstrate a broad commitment to the needs of at-risk students. In such contexts, the intervention programme would be merely one element of a comprehensive package which includes reform of organisation, curriculum and teaching practices.

Notes

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The research described here was the subject of a paper presented at the 1991 conference of the Australian Association for Research in Education

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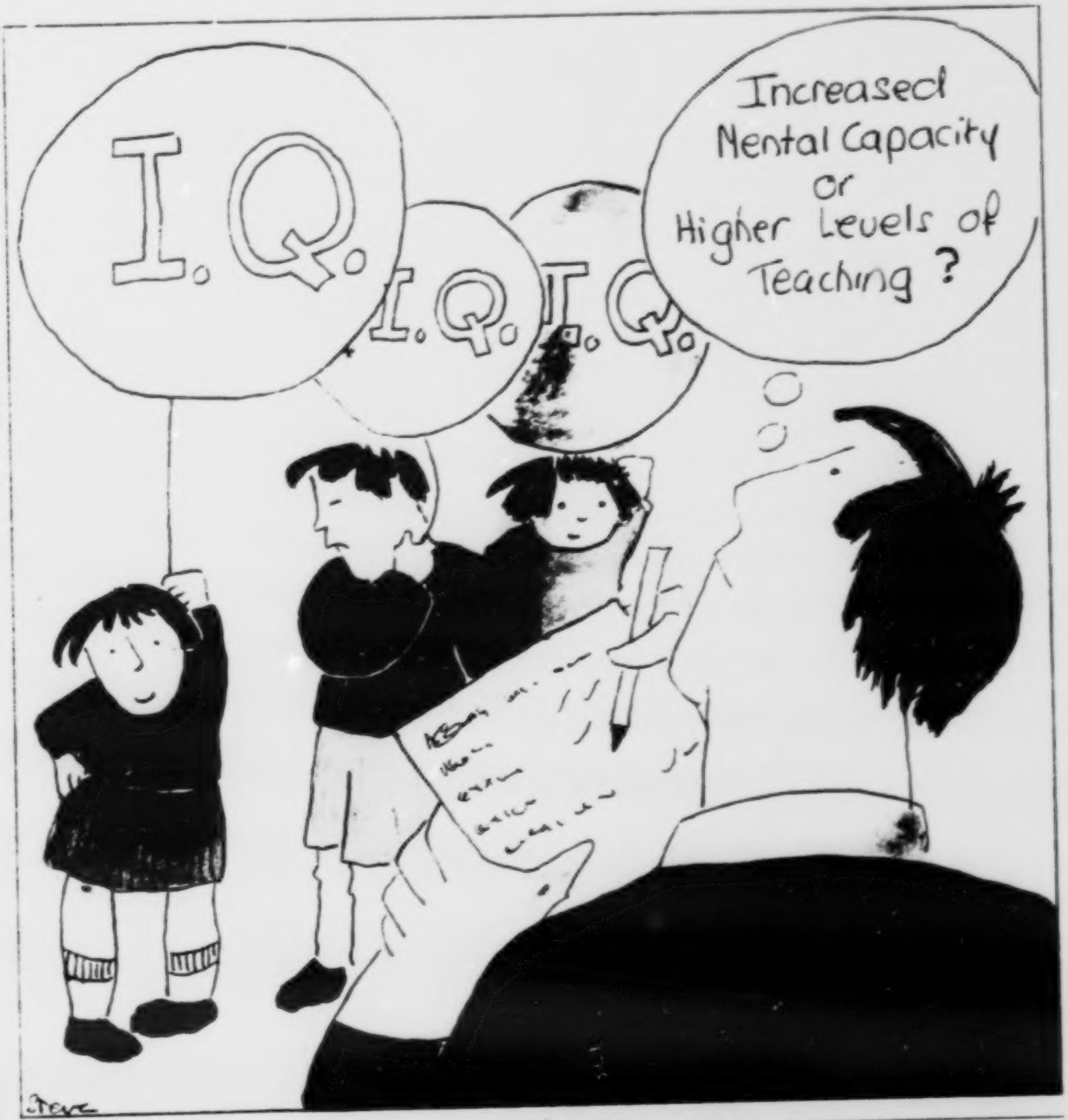
Learning to be Intelligent or Oh Good, That Was Clever!

Teaching How to Think

Geraldine McDonald
Wellington


I.Q.
I.Q.
I.Q.
Increased Mental Capacity or Higher Levels of Teaching ?
Steve

Shona McLean

OUR ATTITUDE TO CHILDREN in schools has been gradually becoming more humane. They are no longer considered to be limbs of Satan who must have knowledge beaten into them. Nor are they thinking machines who just need knowledge repeated and reinforced.

We realise now that children learn a lot of things that are not written into syllabus statements and are never timetabled. There is the 'hidden curriculum' of attitudes and power. But there are also **school-ways-of-thinking**. These special academic techniques are taught (though often they don't realise it) by teachers.

In the third part of this ***set*** item I look at some of the academic (but non-syllabus) learning and teaching that goes on in junior classes, as they were revealed by video-taping classrooms in action. However, the trail that led to this particular research was quite unusual and involved quite different types of research. The whole story suggests that radical re-thinking of thinking is needed, and more particularly, changes in the ways we measure and assess intelligence.

Part 1

Education systems and their effects

Last century, systems for educating whole populations were invented and established. Everyone was to be educated, not just those who showed an aptitude for scholarship. All children, willing and unwilling, academically able or not, went to school. To handle the problem of how to teach children of varying age, background and ability, schooling was arranged in a series of levels each of which was matched to a year of age. Each level had its own prescribed subject matter which, it was thought, the 'average' child of that age should be able to master. These expectations for achievement provided the 'standards' – and hence the name given in New Zealand to school classes in primary schools: Standard 1, Standard 2, Standard 3 and Standard 4, (equivalent to Year 2, Year 3, Year 4 and Year 5 in Australia). No matter what the official age for starting school, nor the method of entry (on a birthday, or once a term, or once a year) children were to be gathered up into groups on the basis of age and all were to progress together.

It soon became obvious that not all children could reach the standard as it had been prescribed. Backlogs of children built up in the beginning classes, and there these children stuck, unable to move on until they reached the required standard. Were all these children incapable? Or were some of them of normal ability and failing for some other reason? It was this issue which led the French psychologist Alfred Binet in the early years of this century to develop a set of test items intended to distinguish those children in need of special education from the rest. His battery of test items was not the first attempt to measure intelligence but it was the first to focus on reasoning.

Binet decided that it was insufficient to compare children solely on the number of test items correct and that account should be taken of the child's age. And so the concept of age has been an integral feature of intelligence tests (and many other kinds of standardised tests for school children) ever since. Binet's method of arriving at a mental age later became a ratio called an intelligent quotient – the well-known IQ. Lewis Terman, discussing Alfred Binet's invention of a score adjusted for the age of the child (mental age and IQ) asked, 'Why should a device so simple have waited so long for a discoverer?' Terman's own answer is, 'We do not know. It is of a class with many other unaccountable mysteries in the development of scientific method.' The answer is, however, very simple. The device depended upon the invention of national systems of schooling. Once the device was invented developers of intelligence tests tried out their test items on samples of children of the same age, irrespective of their class/grade placement.

Until very recently the belief that standardised tests of general ability measured some increasing mental capacity which was independent of schooling, remained unchallenged. If two children got the same number of items right but one was younger than the other, it was firmly believed that the younger was brighter. Now, however, there is evidence from a number of sources, that you have to check what *level* the child has been taught at, as well.

Why has there been so much faith in the power of maturation alone to produce gains in intelligence? For over 90 years the belief that intelligence tests tapped something other than schooling, something that grew with age, has been reinforced by the widespread practice of establishing age norms for achievement on standardised tests. When such tests are tried out on large numbers of children the average scores of age cohorts (that is **all** the children within a given band of age) rise month by month. For example, if you test all the children between the ages of 9 and (just under) 9 years 3 months, their average test score will be a little less than the average score of children who are 3 months older. The average score of each cohort rises *with* each month of age. And so it has been assumed that the scores rose *because of* age.

Part 2

A long research trail

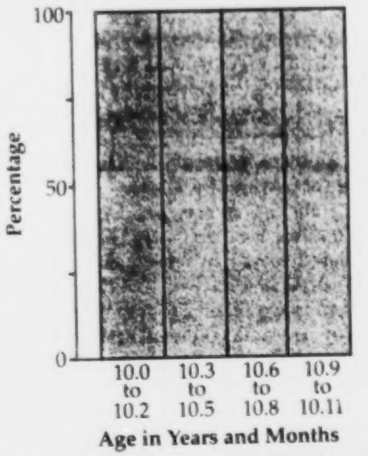
The demography of the classroom

Some years ago I began to look at the way ages are spread across school classes (grade levels) – the demography of the classroom. This involved looking at how children progressed through the levels of the school system. A summary of this research was published in ***set*** No.2, 1988, as Item 3, 'Promotion, Retention and Acceleration'.

Models of education systems usually show a series of steps, each step representing a level at which children of a given age remain for the school year; at the end of the year they progress to the next level. Whether the custom is for children starting school to enter once a year, once a term, or individually throughout the year, there is a point at which children are gathered together and thereafter generally progress through school together. If this model was being followed exactly, then all the children of a given age (for example, from 10 years 0 months to 10 years 11 months) would be found, at mid-year, at one level of schooling, and none would be found at another level. Plotted as a graph the result would be like this:

Figure 1

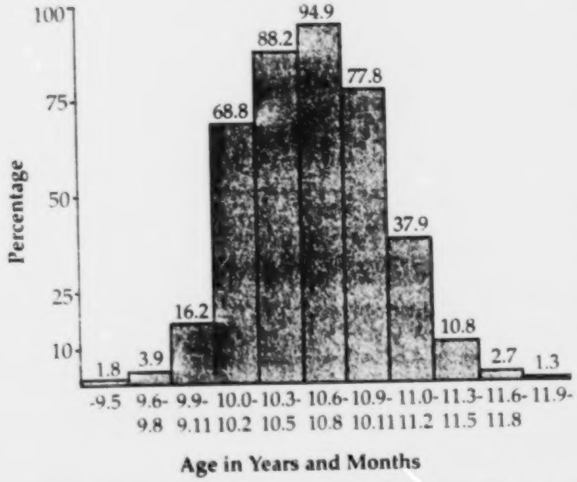
Percentage of each 3-months age cohort in Standard 4 (Year 5) Theoretical model.



But if you go to official statistics, or the information on age-by-class (grade)-level obtained from large samples of children, for example, when tests are standardised, you find that in real life the picture is quite different:

Figure 2

Percentage of each 3-months age cohort in Standard 4 (Year 5) Actual



These data were collected when the Test of Scholastic Aptitude (TOSCA) was normed in New Zealand, 29 April to 1 May, 1988.

The figure shows that even those children who are meant to be in Standard 4 (Year 5) do not have an equal opportunity to be placed at that level. For example, a child between the ages of 10 years and up to 10 years 3 months, had only a two thirds chance of being at the 'correct' level, whilst almost all the children only 6 months older had reached the 'correct' level. Yet all the children in these two age bands started school in the same year. The graphs for other classes/grades are almost identical.

Class level and ability

Because people are so used to looking at the curve of normal distribution and associating it with the distribution of intelligence I suspected that most people looking at my curve of the distribution of ages at a class (grade) level, such as in Figure 2, would immediately assume that the younger the children, the smarter they are, and the older the children, the less smart they are. Indeed people did react this way. However, there is nothing in the graph that demonstrates any association between age and ability. All it shows is the proportion of each age cohort. Another reaction to the graph was that it showed a random distribution of age; but a random distribution would look like Figure 1, which shows that children of every age have an equal chance of being in the right class.

The children missing from each cohort are to be found in higher or lower classes. In the case of the very youngest children, most of the age cohort has not reached the class/grade level illustrated in Figure 2. As the cohorts increase in age, more and more children are to be found at higher class/grade levels. The proportions are determined not by chance but by the child's month of birth in relation to the school year. This is true for the out-of-age children as well as for those at the expected-age for a class level. Similar patterns of distribution appear in the school systems of many other countries – in Australia and Britain, for example. (It is not just a quirk of the New Zealand system of entry to school on the fifth birthday although that may contribute to the size of the hold-back rates, that is, the proportion of children who should be at a given level but who are in fact in a lower class/grade.)

As age increases month by month a greater proportion of an age cohort is to be found at a higher class level. As I calculated this I could see that the rise in average test scores could be just as easily explained by the rise in average class level as by a rise in intelligence. I put these two possibilities (rising level or rising intelligence) to the test. I found that age had virtually no effect, that the level at which the children were being taught caused the differences usually attributed to age.

Technicalities

I tested this result by a new analysis taking only those children with ages spanning one year whose ages matched a given class/grade level. If it was age which was causing the rise in 'intelligence' scores, then average scores would go up with age alone, and the fact that all children were in the same class would have no effect. If it was class/grade level which brought about the rise then the fact that all the children were of the same age would have no effect – each age group within the total would have the same average score. Of course they would all have to be tested at the same time and using the TOSCA raw scores enabled me to see the results of such a test.

When you compare the average score of groups of children at three months intervals within the expected age for a class/grade, their average scores are virtually the same. If there is no difference in average score between the older and the younger children at the same age/grade level then, obviously, age cannot be held responsible for the rise in scores. What has been interpreted for so many years as some factor independent of schooling but associated with age (namely intelligence) turns out to be an artifact of age norming combined with national education systems in which slippage occurs between age and level of schooling. Terman's joy at seeing a new manifestation of scientific method must be dimmed.

In New Zealand the youngest children within the year group obtain slightly higher scores than the oldest children within the year group. In Britain the youngest children within the year group regularly obtain slightly lower scores than the oldest children. The reason for this difference lies in the differences in regulations on entry to school. In Britain bright 4-year-olds may be selected to progress ahead of their age mates while in New Zealand, where children are not permitted to enter school before the age of 5, a proportion of the youngest in the year group are kept back and some, but not all of these, will not be as advanced as those who proceed according to their age.

Therefore, I had to conclude that the only influences on average raw scores of group intelligence tests normed on school children were, (1) the level of schooling that was reached, (2) the selection process that sees certain children promoted out of junior classes more quickly than others. The second of these accounts for the small differences in average scores between the oldest and youngest in a year group.

Of course individual children vary in their scores, that is, they vary in ability, as measured. Some cope better with school work than do others. But irrespective of individual variation in scores or success at school, on a test standardised on a school system arranged in levels, the higher the class level the more likely is it that a child will get a higher raw score.

Old explanations and evidence from overseas

For decades the difference in scores of groups of children born in different birth months has been known. The reasons suggested for this phenomenon have been bizarre and varied; for example it was suggested that winter and summer light levels affect intelligence; and only recently it was claimed that teacher expectations were the reason. Now it can be seen that your birth month has a big influence on the level of schooling you have received when you are tested.

But all this might have been something peculiar to New Zealand and its school system. Therefore, I was delighted to discover that other people, starting from different perspectives, and using samples of children from other countries, had also found that test scores were measuring the effects of level of schooling rather than increase in age.

Marion de Lemos in Australia had been looking at what it is that intelligence tests measure. As a user of tests she had come to distrust age norms and felt that grade norms would be more accurate and fairer. As a test developer at the Australian Council for Educational Research she put her theory to the test using the raw scores obtained on a wide range of tests including non-verbal tests. She found that when tests were administered at a single point in the school year there was no increase in average scores within a grade but a large increase in score from grade level to grade level. A large scale investigation carried out by Sorel Cahan and colleagues of tests used in the Israeli school system pointed to the same general conclusion.

Whether investigated by means of logic or by statistical analysis the only answer that anyone who has examined the issue has been able to find is that, far from measuring some mysterious factor which grows with age, it is school learning itself which is being tested by standardised tests, whether these are classified as aptitude or achievement tests.

Part 3

The teaching of intelligent thinking

If intelligence tests are testing what is taught in schools, then it must be possible to spot teachers teaching the kind of things which are tested in intelligence tests. My opportunity to put this to trial came as part of the study of the junior school classrooms (the first three years of schooling) using video-recording, being carried out at NZCER. An earlier report (written with Joanna Kidman) from this study appeared in ***set*** No.2, 1991, as Item 14, 'Ten Days in New Entrant Classrooms'.

Literacy

Children learn many things which do not get written into syllabus statements and which are never timetabled. School-ways-of-thinking are a case in point; for example, logical thinking is very important in science and mathematics, not so important in everyday life. Studies of the functions of literacy have suggested that written texts supply the conditions for logical thinking.

Research on teaching reading shows how reading-for-meaning is encouraged in New Zealand classrooms. Studies of how mothers 'scaffold' the learning of language by their infants (noted first by Jerome Bruner) have been very revealing – there is a very good item called 'What Joyce learnt from her mother' in ***set*** No. 2, 1985. These insights suggested a way in which modes of thinking might be taught in classrooms.

There have been many studies of how literacy influences thinking. Once upon a time you were said to be literate and intelligent if you could read a familiar passage aloud. The modern interpretation involves the ability to draw inferences from unfamiliar material, 'going beyond the text' and 'reading between the lines'. Also, many intelligence test questions involve manipulating words, filling in blanks in sentences, deducing meanings from text. All in all, it seemed likely that 'intelligent thought' would be detected in the way in which teachers introduce children to the use of written texts. Something written gives the reader – even a very young child – a chance to spin meanings out of the statements. And because written texts stay the same, the reader can return to them again and again to determine their full meaning.

Examining the video record

The video-recordings were examined to see whether the teaching of reading did in fact incorporate such ways of thinking about texts. Of course the teachers were not giving the children practice in answering items from IQ tests. What they were doing, however, was introducing children to ways of reasoning: 'What does this sentence mean?' 'What does this word mean?' 'Is this word like another word?' 'Is it different?' 'What comes next?' 'Is there something missing?' These questions are similar in style to tests of verbal reasoning in intelligence tests.

We found numerous examples of teachers who were teaching whole class groups using techniques similar to the Cloze technique. In this technique, as in many items in intelligence tests, gaps are left in sentences for children to fill in. Another technique in constant use was that of asking children to 're-run', that is to examine the text again, to find out whether their interpretation made sense. Teachers were indeed providing scaffolds to help children to comprehend written texts.

A typical group reading session

The teacher is taking shared reading with the children. They are sitting on the mat, facing the teacher. The teacher shows the class the cover of the book and asks what the title is.

11:08	Teacher:	Three little pigs?
	Gary:	The, the was a pig.
	Teacher:	'The was a pig', does that make sense?
	Children:	No.
	Teacher:	Oh. I like the way Russell re-runs to find out whether it makes sense. *(Pointing to the title of the book, as she says words)* 'There was a pig.' *(Continues)* This was a song. I don't know whether it's got any music in it. We might have to make it up.

Teacher: *(reading from the first page)* 'The pig went out to dig'.
(to class) Hear anything?

Boy: No.

Danny: Pig, dig.

Children: Dig.
(Teacher points to each word with a pen, as she continues reading the story)

Teacher: 'There was a pig went out to dig, on Christmas day, on Christmas day.
There was a pig went out to dig, on Christmas day in the morning'.

Gary: *(Pointing to a comma on the page)* That's a talking mark.

11:09 Teacher: Another talking mark?

Wayne: COMMA!

Teacher: Comma. What does a comma mean, Wayne?

Wayne: It means to rest.

Teacher: It means to have a rest. It's different from a full stop. How's it different from a full stop, Wayne?

Wayne: Um.

Teacher: *(to Simon)* Simon, you can't even see what we're doing.
You're so busy fiddling around with your shoe you're not even watching.
(Teacher continues to read, pointing to the words with her pen.)

Teacher: 'There was a crow went out to plough on Christmas.' A crow!

Danny: *(calls out)* No. A cow.

Teacher: 'A cow', how silly. How would I make that word into 'crow'?

Children: Crrr.

Danny: 'L'.

Girl: 'A'.

Kate: 'R'.

Teacher: Good on you, Kate. You'd have to put an 'r' in it to make it into 'crow'.Good on you, you're listening to it.

Kate: 'Cos I know my sister's name's Rose and it's got 'r' and a 'r', 's', 'e'.

The teacher uses several techniques of scaffolding. She introduces word sounds in the context of working out how to convert one word into another. She refers to 're-running' to find out whether a passage makes sense. She comments on punctuation in response to a child's remark and she compares a comma with a full stop. She asks for a definition of a comma. She says, 'Good on you' to a child who has answered correctly. All this in the space of two minutes!

Spot the mistake

To do multiple-choice test items it is important to know which selections are incorrect. This is another kind of school-thinking which is taught; teachers frequently created anomalous situations by inventing mistakes and asking the children to spot them. There was an example ('crow' for 'cow') in the transcript we have just looked at. Another follows. (There are two main reasons why some parts of the transcript say *inaudible*: in some instances the microphone did not pick up what was said; in others children, uncertain whether they had the answer, seemed to mumble deliberately.)

Two classes combined (about 40 children) are sitting on the mat facing the teacher. The teacher has read the book *The Blanket* as shared reading with the class. She has reproduced the text on large sheets of newsprint. The newsprint is on an easel. The teacher is intentionally saying wrong words as she reads the story. She uses a ruler to point to the words.

11.19 Teacher: Right, now you've got to watch very carefully. I might make a mistake. But listen – only quiet noises. I don't want big shouting noises 'cos it might give me a headache.

Boy: Only, if you put your hands up.

Boy: Hands up if you umm...

Teacher: Hands up if you spot the mistake.

Girl: Not yet.

Teacher: *(reading)* 'When I go to bed, I always take my blanket'.

Boy: *(inaudible)*

Boy: No.

Boy: You wasn't a mis...

Teacher: *(to Aaron)* Did I make a mistake, Aaron?

Children: No.

Teacher: *(to Aaron)* What mistake did I make?

Aaron: When I go to bed.

Boy: *(Inaudible).*

Aaron: I...

Teacher: always...

Aaron: ...take my blanket.

Teacher: *(to Aaron)* That's what I said. What's the mistake, Aaron?

Aaron: The top one.

Teacher: What – when? What do you think it should be?

Aaron: When I go.

(Teacher points to the words with a ruler as she reads them)

Teacher: *(reads)* 'When I go to bed I always take my blanket'.

Joe: That's what you said.

Teacher: Hmm..., I don't think I made a mistake there?

Aaron: You did.

Teacher: *(to Aaron)* Do you think so?

11.20 Joe: It has to be a 't' on the end if it's 'when....'

Teacher: Let's have a look at this one.

(Teacher turns the page. She points to the words with a ruler)

Teacher: *(reading)* 'One day I could not find ...'

Children: *(interrupt)* No-oo!

Teacher: *(still reading)*... 'my blanket'.
(to Joe). What was the mistake?
(Joe goes to the easel, and pointing to the words with his finger, he reads)

Joe: 'One night I couldn't find my blanket'.
(Teacher corrects Joe's 'couldn't' with 'could not')

Teacher: 'I could not find my blanket'.
(to children) What did I say? I said 'one....'

Children: *(unison)*...day.

Teacher: 'Day'
(pointing to 'night'.) Could that be day?

Children: *(unison)* No-oo....

Teacher: *(Inaudible)* start with?

Children: D. D. D.

Girl: Double day wahh!

Girl: D A Y.

Teacher: So it should be 'One night, I could not find my blanket'.

(Teacher turns the page)

The children were familiar with the technique and what was expected of them. In fact the session took place because a child had asked, 'Can you make mistakes, after you've read it properly?' The children understood that they had to report mistakes. The spotting of mistakes involves two steps – knowing that an error exists and being able to explain what it is. Aaron's response showed that while he understood that he had to report an error he probably did not know that he was required to identify the actual mistake. Joe refers to 't' on the end and is probably identifying 'blanket' and whether or not it is correct.

Going beyond the text

There were numerous examples of teachers asking children to go beyond the direct meaning of the text and to draw inferences from it. A description follows.

The teacher is discussing two stories with which the children are already familiar. These are *Mr Gumpy's Motorcar* and *The Shoemaker*. The class is sitting on the mat, facing the teacher. The teacher is asking questions about the 'problems' presented in each story. The children are to notice how the problems were resolved.

9:24 Teacher: This week we're going to have choosing time, and going to think about problems in two stories. *Mr Gumpy's Motorcar* because Mr Gumpy had a problem. What was his problem, Elizabeth?
(Children raise their hands.)
Elizabeth: He got stuck in the mud.
Teacher: Right. How did he... how was the problem solved?
(Children raise their hands.)
Teacher: James?
James: The... *(inaudible)*.
Teacher: Say it again.
James: The.. *(inaudible)*.
Teacher: Yes, right, okay, what happened, what else happened?
(Children raise their hands.)
Teacher: Richard?
Richard: He.., um.., it started to rain.
9:25 Teacher: Yes, and what did that do?
Richard: Um...., got him out of the mud.
Teacher: Yeah, okay. How did they get out of the problem...
(Children raise their hands.)
Teacher: Jonathan?
Jonathan: Gave him a push.
Teacher: They all pushed. Good boy. They pushed so that they um... got him out of there.

After a dozen exchanges about the other story:

Teacher: *(continues)* So sometimes we are helped out and sometimes we have to help out. So here at choosing time today, I want you to think about those things. And if someone's beside you who needs some help, what will you do?
(Some children raise their hands.)
Children: Help out.
Teacher: Help out. What if you need some help, what do you do?
Children: Ask.
Boy: Help somebody.
Teacher: You ask somebody. You talk about it.

This is an example of a teacher encouraging children to recognise problems which may not be directly identified in stories. The children go beyond the text. She also asks the children to reflect on the moral lesson in the stories and how it can be applied in their own lives.

Children alone

Transcripts of children reading in groups without the teacher were next examined to see whether children used the techniques of the teacher when they helped each other to read. There was no evidence of that. When children 'taught' each other they did not use the techniques referred to here as scaffolding; the children just pointed out the errors made by others, and supplied the right answer. Following is an example of children reading a text.

Two boys are sitting on chairs reading a big book entitled *What's In the Cupboard*. A third boy joins them. There is no teacher present.

Jason: *(points to the words as he reads)* 'Two big bones and three little, and three little... bones.'
Tom: *(points as he reads)* 'Four...'
Jason: 'Pink...'
Tom: *(completes the sentence)* ... 'ice-creams.'
10.06 Jason: *(pointing as he reads)* 'And four'.....er, um.
Tom: Er.
(William asks to join in.)
William: *(Inaudible)*.
Jason: No, we haven't got a chair.
(William kneels down by Tom. He is more competent at reading than either Tom or Jason.)
William: *(reads)* 'Five short mugs'.
Jason: *(reads)* 'Five short mugs'.
William: *(reads)* 'Two fat jugs'.
Jason: *(reads)* 'Two fat jugs'.
William: *(reads)* 'And six skinny jugs'.

This event can be compared with the account of large group reading led by the teacher given earlier. By themselves, the children did not discuss punctuation or word sounds, nor withhold the answer whilst helping the others to work it out for themselves. The agreed-upon task, the shared meaning of the event, was to read the narrative but this was embroidered with bits of children's business which arose as the event unfolded. They helped each other with the physical handling of the book and sorted out whose turn it was to read.

Other areas of the curriculum

Group reading sessions might not be the only time in the school day when children are specifically encouraged into school ways of thinking. We looked at what happened in physical education, science, writing and music and noticed two things. First, whatever they were teaching, teachers praised 'thinking' and drew children's attention to examples of good thinking. Teachers often described children's responses as very 'clever' and behaviour as perhaps 'not very clever'. Thinking as an activity was regularly brought to the consciousness of the children.

The second finding was that different forms of reasoning appeared in different areas of the curriculum, dependent in part on the teacher's approach, on the nature of the subject matter and on the resources being used. For example, in a physical education lesson the teacher did not hold discussions with the class – a child's ability to throw and catch a ball was not a matter of verbal logic. In this case success could be judged by looking at the trajectory of the ball; did it return to the child's hand or did it roll around the playground? The teacher guided the children's control of the balls by explaining directly to the children that they would have greater success if they made short throws. The teacher worked to improve the practice rather than the theory of throwing.

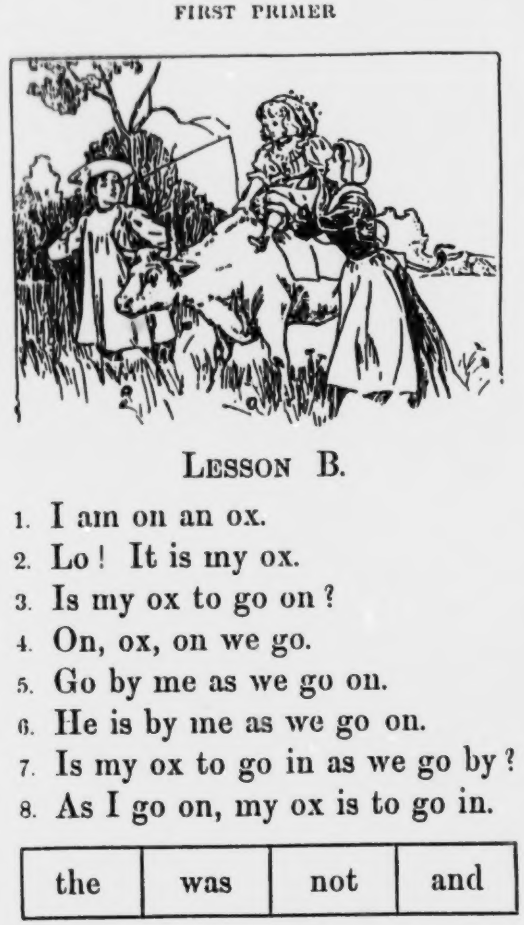
Finally we looked at transcripts of video recordings made when children were in their third year of schooling and found little evidence of the teacher introducing the class to thinking strategies in the context of learning to read. The reason was that by this stage most children were reading independently.

Conclusions

The video-recordings, when examined carefully, revealed that the ways of thinking that are necessary for answering the verbal items in standardised tests of general mental ability are being introduced and taught in new entrant classrooms; that they were found particularly during the times when the teacher gathered the whole class together to study a written text; that teachers often drew children's attention to the process of thinking; that they defined intelligence by pointing to examples of good thinking; and that they frequently put intelligent thinking within a moral framework by describing its authors as 'good'.

Historical research

In the quest for examples of teaching intelligent reasoning a look back proved fascinating. We compared the kind of texts common in schools today with texts published in 1898.



FIRST PRIMER

LESSON B.

1. I am on an ox.
2. Lo! It is my ox.
3. Is my ox to go on?
4. On, ox, on we go.
5. Go by me as we go on.
6. He is by me as we go on.
7. Is my ox to go in as we go by?
8. As I go on, my ox is to go in.

the	was	not	and

It was obvious that it would have been very difficult for a teacher using this particular text to frame questions which would reveal underlying meanings. The present day teacher uses books and reading schemes which stress meaning rather than sounds.

Comments

It has been a long research journey from finding that children have different chances of moving on from the junior school (depending on month of birth), to identifying the ways of thinking to which five-year-olds are introduced in school. Leaving junior school does not depend on the way you are taught to think, so the demography of the classroom simply raised the *possibility* that tests of general ability were not tapping some underlying mental ability that grew with age, but rather, capturing rises in the average class level month by month. The research on promotion patterns showed a way of putting this to the test. What this study of new entrant classes has been able to show is how, upon their entry to school, children are introduced by their teachers to what is often called 'higher order thinking'.

What does all this mean? Are teachers teaching to tests? Of course not. Junior school teachers begin the process of teaching school ways of thinking. These ways are, in turn, heavily dependent on written texts. That is why literacy alone has sometimes been held to have shaped modern consciousness.

But it is not enough to just be literate. Scribner and Cole discovered this in some fascinating research (mentioned in the notes). Reading and writing is not enough; there must also be schooling.

The study of junior school classrooms has demonstrated how both literacy and *thinking* are brought to the attention of children at the same time. The mental capacities tested by items in standardised tests of ability and achievement are *taught*, and learned, as children are introduced to ways of thinking critically about bodies of knowledge.

Whatever level they teach at and in whatever curriculum area, teachers will find it illuminating to look at the modes of thought they are presenting to children. What types of thinking are the children expected to pick up? Science, technology and good government all depend, heavily, on the type of thinking – the type of 'intelligent' thinking – we are taught to handle in our very first hours of schooling as we are led into literacy.

Notes

DR GERALDINE MCDONALD was Assistant Director of the New Zealand Council for Educational Research when this research was begun. Now retired, she is an Educational Research Consultant, from 50 Highbury Road, Kelburn, Wellington, New Zealand. Recently she was the Visiting Fellow in the School of Education International Centre, University of Newcastle on Tyne, England.

She would like to thank Victoria Clarke and Joanna Kidman who have worked with her on the study of junior school classrooms, and Alison Gilmore for giving her permission to examine the scores, ages and class levels of the children who constituted the norming sample for the TOSCA.

The comment of Lewis Terman's about Binet's invention of mental age – taking the age factor into account – comes from

Terman, Lewis, M. (1916) *The Measurement of Intelligence: An Explanation of and a Complete Guide for the use of the Stanford Revision and Extension of the Binet-Simon Intelligence Scale.* USA: George Harrap, p.41.

It is important to check the *level* at which a child has been taught as well as his or her age. In fact, age alone has no effect on the level of scores on tests standardised on school populations. So long as the children being tested are at the same class level, variations in age (at least inside the usual range of ages at that level) seem to have no influence on scores. However, it makes a great deal of difference to children of the same age what class (grade or level of instruction) they are in. A child in a higher class than his or her age-mates is likely to have a correspondingly higher score. Similarly for lower ages and lower scores. This conclusion needs to be explained more fully for those interested in the details. Other articles on the topic are given below. Age appears to have no effect, at least within the range of ages found at a given level of schooling; that is, no effect on the raw scores of tests standardised on school populations.

Articles on the research into the demography of the classroom (in particular the respective roles of age and class level on test scores) culminated in the following article, a response to it and a response to that:

McDonald, Geraldine (1991) Henry and Iain Meet the PAT Age Percentiles. *New Zealand Journal of Educational Studies*, Vol. 26, No.1, pp.65-73.

Elley, W.; Reid, N.; Hughes, D. and Croft, C. (1992) Ages Norms on the PAT: a response to McDonald. *New Zealand Journal of Educational Studies*, Vol. 26, No.1.

McDonald, Geraldine (1992) Henry & Iain: A comment on a response. *New Zealand Journal of Educational Studies*, Vol.27, No.1.

Evidence about level of schooling being more important than length of schooling or age, from Australia and Israel, can be found in

De Lemos, Marion M. (1991) Effect of Relative Age Within Grade: Implications for the Use of Age based Norms for Group Tests of General Ability. *Psychological Test Bulletin*, Vol.47, pp. 370-385.

and

Cahan, Sorel and Cohen, Nora (1989) Age Versus Schooling Effects on Intelligence Development. *Child Development*, Vol. 60, pp.1239-1249.

The Junior School Study, using video-recordings, carried out by NZCER for the NZ Ministry of Education, is found in

McDonald, Geraldine; Clarke, Victoria; Kidman, Joanna (1991) *Junior School Study: A Study of Classrooms Containing Five-year-olds.* Wellington: NZCER.

and

McDonald, Geraldine; Clarke, Victoria; Kidman, Joanna (1992) *Junior School Study: Five-year-olds and their Curriculum.* Wellington: NZCER.

and

McDonald, Geraldine; Clarke, Victoria; Kidman, Joanna (1992) *Junior School Study: New Entrants to J.3.* Wellington: NZCER.

Scaffolding is the process by means of which more experienced people shape the responses of learners. The concept was introduced by Jerome Bruner to explain aspects of language acquisition and has since been extended to describe learning in classrooms. See, for example,

Bruner, Jerome (1978) Learning how to do things with words. In Bruner, J.S. and Garton, R.A. (eds) *Human Growth and Development.* Oxford: Oxford University Press.

The idea that written texts create the means for logical thought comes in texts such as:

Goody, Jack (editor) (1968) *Literacy in Traditional Societies.* Cambridge: Cambridge University Press.

The modern interpretation of reading as involving the ability to draw inferences from unfamiliar material 'going beyond the text' etc., can be found, for example, in

Mooney, Margaret (1988) *Developing life-long Readers.* Wellington: Department of Education.

Good examples of what tests of mental ability contain can be found in the manuals about tests which their developers produce. For example, see mention of analogies, synonyms, word meanings, sentence comprehension, alternate words, run-on sentences, definitions and disemvowelled words in

Reid, N.A.; Jackson, P.; Gilmore, A.; Croft.A.C. (1981) *Test of Scholastic Abilities: Teachers' Manual.* Wellington: NZCER.

The illustration from an old reading book is from the Hugh Price Collection:

Whitcombe & Tombs Ltd. (1911?) *First Primer* (The Imperial Readers, Southern Cross Series, Reading and Word Building, Coloured Illustrations, Drawing and Transcription Exercises). Christchurch, Wellington, and Dunedin, N.Z.; Melbourne and London: Whitcombe & Tombs. Price 4p.

The work of Scribner and Cole is fascinating. It has a substantial impact on the question of how much learning-to-read and learning-to-think are connected, if at all. There have been claims one way and another, from Descarte's 'I think, therefore I am,' and the early Wittgenstein's 'The limits of my language are the limits of my thought,' to modern cognitive psychologists who see language as a difficult skill connected by chemical and electrical paths to thinking. Scribner and Cole worked among the Vai people of West Africa who had their own system of writing, quite unlike ours, used for personal correspondence and to arrange business deals. Nowadays the Vai have learned English in schools, and if they attend Islamic schools they learn Arabic and its writing. Looking at the older people who had never been to the modern Western and Islamic schools, Scribner and Cole found that many of the sorts of thinking which look as though they depend solely upon the capacity to read and write, in fact, do not. These 'thinking' skills develop only when we go to school. It now seems clear that what we learn at school (about all those other uses of reading and writing) is essential to developing the kind of 'intelligence' that is measured. Illiterate and unschooled people may be just as intelligent as we are, but we cannot, with our 'instruments', *measure* it.

Scribner, Sylvia and Cole, Michael (1978) Literacy Without Schooling: Testing for Intellectual Effect. *Harvard Educational Review*, Vol. 48, No.4, pp.448-461.

and

Scribner, Sylvia and Cole, Michael (1981) *The Psychology of Literacy.* Cambridge, MS: Harvard UP.

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item 3

THERE WILL STILL BE DAYS

PROFILE OF A TRUANT

set
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Patricia Berwick-Emms

THIS CASE STUDY was written up because truancy is much in the news today, but very little is said about solutions. Names have, naturally, been changed, and places left out, to avoid identification.

Solutions

There are various theories about solutions. For example, we have the draconian theories: 'Just employ a truancy officer, he'll get them back to school without all this fuss.' 'Just take the family's benefits away from them. That will make them get them off to school.' 'If they don't want to go to school that's their problem. They'll soon learn when they cannot get a job.'

Then there are the social theories. 'Call a family conference. That places the responsibility back on the families.' 'You have to find out what the underlying cause is. You can't expect them to learn if they have a major problem.' 'Give them counselling. Then they will go to school.' 'The schools are not doing their job. Improve the quality of teaching and all the children will want to go to school.'

And there are the behaviour theories. 'Set up a structured programme for the child that fits the child and the child will go to school.' 'Home is more interesting than school. The parents must make home a less attractive environment.'

In New Zealand, where I live, there have been several programmes which have demonstrated how to help settle children back at school; for example, Mita Mohi's Taiaha Programme in Rotorua and Te Reo Whanaungatunga interpersonal and family relationships programme in Christchurch. Highly structured programmes like the return to school programme offered by the Child and Family Unit at Burwood Hospital, Christchurch have also been demonstrated to work. But what of the other suggestions?

Profile of a truant

The following is a brief case study of a truant. She began truanting at kindergarten and was attending school only 10 percent of the school year by 14 years of age, when a solution was finally found.

Sarah is a beautiful young blond-headed girl who has always appeared to have an interest in life, if not in school. Her father died when Sarah was four and her mother was the sole care-giver in the family during most of Sarah's early life.

Early days

Sarah's mother's first recollections of school refusal was when Sarah went to kindergarten. Sarah would scream and cry when it was time for her mother to leave her unattended at kindergarten. Sarah said to her mother about this time, 'I hate you because you left me!'

When she started school she liked it. She loved books, colouring in and reading. But by the time she was in Std. 2 (Year 3) sore stomachs and other aches and pains became the norm. Sarah continued to enjoy her school-work but felt intimidated by the other children at play-times and lunch-times. Her mother would have to argue with her nearly each morning about getting dressed, eating breakfast and, of course, going to school. Sarah said she hated the cattiness of the girls at school. Making friends and maintaining them was difficult.

When Sarah was small it was relatively easy to ensure she got to school most days. Her mother did not like having to push her off to school but she did it. She followed the advice of the teacher and offered rewards if she got to school without causing a problem. Nothing her mother did worked for the long term.

The mother sought help from the school psychologist, from the Visiting Teacher (Liaison Teacher) and from the Public Health Nurse. She believed she carried out all the suggestions offered to both herself and Sarah.

About this time the unhappiness at school prompted a visit to Child and Family Guidance. It was here that Sarah found out about her father's suicide. Mother explained this in her own time and in her own way. The father had been diagnosed schizophrenic and did not seem to be able to find a way to be happy. Her mother said, 'How was I to tell a four-year-old her father had committed suicide?' She had told both children their father had been ill and died.

They went consistently to Child and Family Guidance for a number of months although at times the mother felt the therapist failed to understand the problem fully. In later years the mother realized that a change of therapist would have been beneficial but felt it was a presumption on her part to ask for such a change at the time. During Sarah's time visiting Child and Family Guidance she attended school regularly then 9 or so months later the excuses began again.

Middle Years

By the time Sarah was in Std. 3 (Year 4) she was quite good at school refusal and Sarah's mother was beginning to become very tired of the constant battle. She did not have this problem with her other children.

During this time period a 14-year-old boy touched Sarah inappropriately. The family returned to Child and Family Guidance.

The class teacher implied it was Sarah's mother who was school refusing and not Sarah. The mother began to feel quite helpless. She found herself yelling at Sarah frequently. The family doctor said, 'Don't argue with her. You tell her. Your problem is you let her have a say!' Sarah's mother tried this to no avail. Sarah was sent to a Health Camp. She could not cope there and hitch-hiked home.

It was not until Intermediate School (Years 11 and 12) that Sarah's mother had the strength to ask for help again. She asked the Department of Social Welfare (as it was called then). Through this some relief was found for Sarah and her mother with a time-out fostering programme. Sarah was still not attending school regularly. The Department of Social Welfare provided some support for the mother but when Sarah returned home the non-attendance continued and no change eventuated. Follow-up counselling was provided by the Department of Social Welfare specialist services and things were calm for a time.

Sarah's mother was trying to keep a job and had recently remarried. This meant there were new children to be fitted into the family. Sarah did not cope well with this. Sarah's school refusal worsened.

High School

Her high school was chosen by her mother, who consulted with the guidance counsellor and Sarah. Sarah continued to school refuse despite a flexible school programme and intense consultation with the mother and Sarah. Nothing seemed to work. Sarah said of herself, 'You don't know how much I want to be like that!' (i.e., going to school like other children). By this time Sarah was in her fourth form year. Her mother said, what she wanted to be, and the reality of where she was at at that time, were two different things.

During this time period the Youth Aid Police rang the Visiting Teacher of the Special Education Service. Sarah had been involved in a minor shoplifting offence.

The Visiting Teacher visited the home and talked with both the mother and Sarah. She heard the despair and anxiety in the mother over all she had tried to do. Sarah herself was unwilling to participate in any therapy programme.

Work experience

After a number of visits and phone calls a programme was set up at school which met Sarah's needs and a 'carrot' was offered to Sarah of something she believed she really wanted to do. This 'carrot' was work-experience at two of the top local hairdressing salons.

This was done because the Visiting Teacher believed Sarah needed to see her school refusal was not refusal of school alone but refusal to do anything which confined her in any way. Sarah lasted one visit to one salon and not much longer at the other. Sarah herself was shocked. She had wanted to leave home - it was, after all, the one last place which confined her. Now she realised she could not keep herself. She had no way to earn money.

The involvement of the Visiting Teacher made Sarah realize it was time to sort things out. Sarah's mother also felt supported by being able to ring the Visiting Teacher as problems emerged.

Because Sarah was now ready for counselling again it was possible to involve the Department of Social Welfare once more. (The government agency now handling such work is the Children's and Young Persons' Service.) They were able to provide the safety-net of a foster family if necessary and ensured therapy was provided.

Back to school

Some months later Sarah was re-introduced to school in a planned programme. She attended school regularly. She has been able to face her worst fear which was to do with the early death through suicide of her father. Sarah now has a chance at a happy future adult life. The co-ordinated approach has worked.

Today Sarah is still happy and her confidence has improved. She knows she made a tremendous effort in successfully returning to school. When she returned she still had the occasional days off but these were for ill-health. Her mother still had a fear which gripped her stomach in case the refusal began again. It is Sarah who comforts her by saying, 'There still will be days Mum, but I will be alright.'

Although the absences have increased in recent months Sarah feels she needs to look for work. She has reached school-leaving age and is ready for work. Although a capable girl, the lack of qualification will severely handicap her in this pursuit.

Gathering up the ends

For young people like Sarah an effective co-ordinated programme needs to be put in place as soon as the problem is identified. Ideally this should be a programme which includes the parent, the class-teacher with perhaps an outside co-ordinator (e.g., Visiting Teacher) to ensure a communicative structure is maintained throughout the whole process. Parents need to understand and feel confident that the school personnel are there to help and will listen even when they, the parents, feel they are unable to solve the problem themselves.

Parents have a sense of failure when their children do not want to go to school and if their children go as far as refusing to go to school this feeling intensifies.

Teachers must first understand that the parent is doing all they can under the prevailing circumstances, then try to find joint solutions through classroom programmes or supporting positive friendship relationships. Children need to be heard when they cannot deal with bullies or cattiness among other students. Many children cannot solve such problems alone. If solutions cannot be found within the school then outside help needs to be sought. This should not be months down the track. Five or six weeks of non-attendance is more than enough to establish a school-life time problem.

Sarah's problems may have been solved early on if teachers had have understood how the cattiness of other children was affecting her and if at the same time Sarah's mother had have felt supported by the school and not felt viewed as a non-coping mother. Such a programme was essential as support for the therapy programme provided by Child and Family Guidance.

Nothing can be achieved in a vacuum. A child's life is part of a continuum. All the early help provided for Sarah was to the point but piece-meal. The whole child within her family and school community was not supported.

There are hundreds of children in our schools who, like Sarah, are truants. Each one of them has different reasons for avoiding school; we need to look to see what has been done to help in order to find what will work. No effective long-term programmes can be established until many possible solutions are examined for successes.

Notes

PATRICIA BERWICK-EMMS PhD, is a Visiting Teacher, working for the Special Education Service. In NZ truant officers had the duty only of enforcing the law. The Visiting Teacher's job is much more one of guidance and assistance. Her PhD thesis was on the 'Hidden Curriculum'; that is, the effect or mis-match between home communications systems and school communications systems on achievement.

An important NZ report on truancy is

Dunn, Mary; Bennie, Ngaire; Kerslake, Jacqui (1991) *Who's Not Here?*, Wellington: Research and Statistics Division, Ministry of Education.

A recent investigation into truancy in a large South Australian high school where 359 boys and 441 girls were surveyed, came up with these figures:

Percentage of children who said that they had 'wagged' school 'lots of times'

	Year 8	Year 9	Year 10	Year 11
Boys	8.7 (9)	16.2 (12)	15.7 (18)	24.4 (15)
Girls	.8 (1)	17.9 (19)	23.2 (22)	32.6 (30)

Actual numbers in parentheses.

Thus, over a four year period we are looking at 15 percent of boys and 18 percent of girls (of course the more senior students were considering a longer period at school).

The NSW South Coast Region publishes a booklet which assists schools develop plans for students coming back after illness, from being reluctant attenders, from suspension, or travel. It is called *Coming Back* and is available from Student Welfare Coordination, Department of School Education, PO Box 1232, Wollongong, NSW 2500.

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item 4

set
number two 1993

MEASURING THE EFFECTS OF SCHOOLING

John Hattie
University of Western Australia

HOW TO ACHIEVE
A
B+

Nicola Belsham

DATA FROM THE PAST 30 YEARS of educational research can be used to find out how effective innovations in teaching are, and even if schooling is effective at all. Does the introduction of a new teaching technique help the children learn? Would it be better to just get a new teacher? Reduce class size? Use computers? Or even send the children home? New statistical ways of handling the multitude of results from 30 years of educational research in many countries gives an answer.

There have been few attempts to measure the effects of schooling. Schooling in most developed countries is compulsory; it is not possible to compare those who go to school with anyone who does not. Thus it is difficult to devise an experiment or to directly test the effects of schooling. But we can ask, *What are the 'typical' effects of schooling?* and then use the typical effect as a benchmark. The first requirement is a continuum of ratings of school effects, with 0 in the middle. A negative number would indicate that the teaching practice or innovation has hindered learning; a zero indicates it has no effect; a positive number indicates some success.

The steps on the continuum scale can be called **effect-sizes**. An effect-size of 1.0 will indicate an increase of one standard deviation, typically meaning that the children have advanced by one year. A second meaning of 1.0 is that the rate of learning has improved by 50 percent. A third meaning is that a 0.5 correlation has been found between some variable (e.g., amount of homework) and achievement. When putting a new programme into action in class an effect-size of 1.0 would mean that approximately 95 percent of the outcomes positively enhance achievement, or, average students doing the new programme would exceed 84 percent of students not doing it. An effect-size of 1.0 would be large, blatantly obvious and grossly perceptible, like the difference in height between a five-year-old and a teenager.

An example

I located 557 studies that investigated the effects of introducing computers. Using meta-analysis, these effects were statistically synthesised. I found (1) an overall effect, (2) the influence of differing groups of students (e.g., males versus females), (3) the influence of different uses of computers, (4) the influence of subject areas, and so on. The average effect-size across these 557 studies was .31.

Thus, compared with classes without computers, the use of computers was associated with (a) advancing children's achievement by approximately three months, (b) improving the rate of learning by 15 percent, and (c) about 65 percent of the effects were positive (that is, improved achievement). One has to remember that 35 percent of the effects were zero or negative, but the average student achievement level after using computers exceeded 62 percent of the achievement levels of the students not using computers. An effect-size of .31 would not be perceptible to the naked observational eye, and would be approximately equivalent to a 25mm difference in the height of two tall adults.

Of course, this is only an overall effect-size from introducing computers. There are many important moderators. For example, the effects decrease with age: primary students gain most (effect-size = .48), secondary students have medium gains (effect-size = .32), and college and university students gain least (effect-size = .25); there are differences in effect-sizes on achievement between males and females in secondary but not elementary classes.

Checking all innovations

A computer search of *Psychological Abstracts, Dissertation Abstracts* and *Education Resources Information Center (ERIC)* identified 134 meta-analyses that related some facet of school learning to achievement. I excluded analyses of: special population groups such as gifted or special class children; specific outcomes such as word recall, discrimination learning, coaching of tests; and those that included fewer than 10 studies related to achievement. Altogether 22,155 effect-sizes from 7,827 studies were computed, representing up to 15 million students, and covering almost all methods of innovation. A summary of these meta-analyses is presented in Table 1.

Asking the big question

'What is the effect of schooling?'. The answer is 0.40. (This is obtained by averaging the effects across the 134 meta-analyses.)

This does not mean that merely placing a teacher in front of a class would lead to an improvement of 0.4 standard deviations, advance achievement by 5 months, and lead to a 75 percent overall improvement. Some deliberate attempt to change, improve, plan, modify, and innovate is involved. The best available estimate of the effects of schooling alone is from the National Assessment of Educational Progress (NAEP) data bank. NAEP surveyed what students in American schools knew and could do in the subject areas of reading, writing, civics, United States history, mathematics and science. The students were sampled at ages 9, 13 and 17, and the testing has been repeated every two years. The average effect-size across the six subject areas was 0.24 per year. This indicates that the effect of innovations is (0.40 – 0.24) = 0.16 standard deviations above and beyond the teacher effects.

Many researchers also say that maturation alone can account for much of the enhancement of learning. The effect of maturation has been calculated by Cahen and Davis as one-third of the achievement effect (0.10). So schooling does enhance learning, above the influences of maturation.

Similarly the typical effect-size of 0.40 may not be uniform across all students. There may be many moderators. For example, when introducing computers the effect is greater for younger than older students. However, these other points not withstanding, the continuum provides a meaningful basis for measuring the effects of schooling.

Table 1

Summary of Relationships to Achievement

Effect	No. of meta-analyses	No. of studies	No. of effects	Effect-size	Standard deviation
School	**16**	**781**	**3,313**	**.25**	**.31**
Aims and policy	6	307	542	.24	.17
Physical attributes	5	372	1,850	-.05	.10
Class environment	5	102	921	.56	.36
Social	**4**	**153**	**1,124**	**.39**	**.36**
Peer	1	12	122	.38	.00
Mass media	1	23	274	-.12	.00
Home	2	118	728	.67	.17
Instructor	**9**	**329**	**1,097**	**.44**	**.28**
Background	1	65	22	.60	.00
Style	8	264	1,075	.42	.28
Instruction	**31**	**1,854**	**5,710**	**.47**	**.29**
Quality	1	41	22	1.00	.00
Quantity	4	110	80	.84	.03
Methods	*26*	*1,763*	*5,668*	*.36*	*.17*
Science	11	730	1,562	.36	.12
Mathematics	6	416	1,713	.32	.36
Reading	8	557	2,333	.50	.29
Others	1	60	60	.28	.00
Pupil	**25**	**1,455**	**3,776**	**.47**	**.36**
Affective	8	355	1,882	.24	.12
Cognitive	8	484	896	1.04	.36
Physical	6	551	905	.21	.14
Disposition to learn	3	35	93	.61	.08
Methods of instruction	**37**	**2,541**	**6,352**	**.29**	**.19**
Individualisation	5	467	630	.14	.14
Simulation and games	2	151	111	.34	.01
Computer-assisted instruction	11	557	566	.31	.14
Programmed instruction	4	285	220	.18	.10
Tutoring	2	218	125	.50	.12
Learning hierarchies	1	15	24	.19	.00
Mastery learning	3	106	104	.50	.08
Team teaching	1	41	41	.06	.00
Homework	2	44	110	.43	.08
Instructional media	6	657	4,421	.30	.25
Learning strategies	**12**	**714**	**783**	**.61**	**.36**
Reinforcement	3	76	139	1.13	.12
Advance organisers	5	430	387	.37	.25
Behavioural objectives	1	111	111	.12	.00
Remediation/feedback	3	97	146	.65	.22
Grand total or mean	**134**	**7,827**	**22,155**	**.40**	**.13**

Three Overall Findings

1.

Innovation is the theme underlying most of these effects. That is, a constant and deliberate attempt to improve the quality of learning results in improved achievement. Getting an innovation under way is usually done with enthusiasm by the teacher, and the students get excited too. This is often said to be an experimental artifact and it is called the Hawthorne effect (after the Chicago telephone factory where it was first observed), or the halo effect. But in this analysis it doesn't matter – no matter the reason, it appears that innovation has positive effects on student achievement.

2.

The most powerful single moderator that enhances achievement is feedback. The simplest prescription for improving education must be 'dollops of feedback'. The effect-size for reinforcement is 1.13, remediation and feedback 0.65, mastery learning (which is based on feedback) 0.50. A good example is that homework with feedback is much more effective than homework without feedback. Another is that feedback is a key factor in effective uses of computers in classrooms. Feedback does not mean using many tests and providing over-prescriptive directions; it means providing information to the child on how and why he/she understands and misunderstands, and what directions the learner must take to improve.

3.

Most innovations that attempt to individualise instruction are not noted by success. Such programmes produce an average effect-size of 0.14, and programmed instruction yields 0.18. The negligible effects of trying to create a separate programme for each child are particularly important when it is recognised that students spend about 66 percent of their time working alone. Too often, individualising means placing the child alone to work on a particular task, usually related to particular needs, progress, pace, and behaviour. These attempts usually have little feedback, the child gets little attention from a busy teacher catering to the other 30 or so students, and the child typically has little knowledge of what counts as success or failure at the *specifics* of the task. The effects dramatically increase when individualised work is coupled or complemented with feedback: for example, peer tutoring and mastery learning packages are both 0.50. The key for the power of these individualised procedures, once again, is feedback.

Implications

The findings along the continuum have remarkable generality – remarkable because most educational researchers and teachers suggest that it is better to treat students individually and that there are unique teaching methods associated with each subject, English, mathematics, etc. The findings about effect-size apply, reasonably systematically, to all age groups, curriculum areas, and most teachers.

The aim for teachers and policy makers should not be to implement *everything* that enhances learning. The costs in time, energy and money would be too great. Rather, compare the various costs of introducing various innovations relative to their benefits on achievement and relative to other effect-sizes along the continuum.

The continuum highlights the importance of assessing competing theories – that is, to compare various innovations. Thus the effect of introducing computers in schools is close to the average effect after introducing most education changes. Those who wish to argue that computers are effective would say, yes, when compared with classes without computers. When compared with typical effects, however, computers are not too different from the average. Maybe it is not so surprising that teachers have found that the effect of introducing computers has not been as dramatic as many advocates and researchers promised. The advocates and researchers compared the results of introducing computers to having zero computers; the teachers compared before and after – the alternatives. As researchers would say, since the null hypothesis typically is not the question of interest, it is no wonder that the answer is misleading; the introduction of nearly all innovations is better than their absence.

Over the past 30 years, various researchers have provided evidence that schools and teachers are not good at enhancing achievement. At one time they seemed to have proved that schools were pretty useless! Plenty of contrary evidence was soon found: Lee and Bryk pointed out that the evidence did not take into account the multilevel nature of schools; factors such as social class can have big effects. Using hierarchical linear models, their studies have demonstrated how the academic organisation of high-schools has a significant impact on the social distribution of achievement within them, and how school ethos is related to academic achievement. Another approach has been to investigate systematically how schools work to produce effects.

Using the continuum, the overall effect-size produced by **home** and social influences is 0.38. However, the effect-size produced by learning processes or presentation (usually controlled by the **teacher**) is 0.62, for the background and style of teachers 0.50, curricula differences 0.48, methods of instruction 0.36; and school environment (e.g., class size) 0.36. The **student** variables are 0.53. Thus schooling does make a difference compared with home effects. Of more interest is the clear implication that teaching competencies make a difference. The major differences relate to certain instructional changes that teachers control and the influence that teachers have over the manner they interact with students. It is clear that things that go on in classrooms are the most dominant in enhancing achievement.

Some cautions

It must also be emphasised that these analyses are based on past studies. That these past studies have been predominantly about achievement should not mean that schooling should be predominantly about achievement. Further, this analysis mixes good and bad studies, although it is typical to find similar findings from good and bad studies. (An expanded version of the continuum can allow for this.) As well as achievement outcomes, there are other outcomes worthy of consideration: emotional/social (affective), flexibility in processing, creativity, reduction of stress, socialisation, economic opportunities, love of learning, and willingness to learn. Schooling and education are typically judged by inappropriate criteria such as how well students can replicate and apply knowledge, rather than (more appropriately) how they can associate ideas and interpret knowledge. These latter are the neglected outcomes of schooling. The results of schooling are often used to 'screen' young people (identify the more able, change the order in the unemployment queue) rather than identify what children can produce, their skills, and their love of learning. A major difficulty in determining the effectiveness of schooling has been that the schools' aims, uses, and missions are often ill-defined by the community or citizenry who want schools and pay for them.

Social and emotional (affective) outcomes

It is possible to construct a similar continuum for social and emotional outcomes. Not surprisingly there are far fewer studies. The overall effect-size, after synthesising 2,269 relationships between various programs and affective outcomes, was .22. The low and negative relationships included desegregation (.01), ability grouping (.16), computer-assisted instruction (.05), open versus traditional classes (.12), programmed instruction (-.14), and class size (-.09). Medium effects included remediation (.19) and co-operative learning environment (.21). Large effects on affective outcomes included peer tutoring (.34) and mastery learning (.69).

Putting it all together

The model I have been working with does not suggest that effects on achievement are cumulative. It would be too easy to wish that by merely introducing many innovations, achievements could accrue rapidly. Rather, the effects on achievement probably follow what is known as a Cobb-Douglas function – this is a sort of law of diminishing returns: after initial gains, the increases in achievement quickly taper off. Moreover, knowledge often comes from restructuring rather than accumulating. Achievement occurs not only by accruing or accumulating information, but also by the creation of higher-order structures that aid in reinterpreting old information or aid in accounting for new information. The facility to discern patterns in knowledge rather than merely being encyclopaedic is a critical aim in education. This restructuring has rarely been assessed by past researchers.

There are also, occasionally, some non-linear effects. For example, up to 10 hours of television was associated with small increases in achievement, but greater than 10 hours was associated with gradually decreasing achievement. There is a linear trend between achievement and class size which runs steadily down from class sizes of a hundred down to classes of about 25; then there is an exponential increase in achievement as classes become smaller than 15.

The majority of these findings are derived from studies conducted in the English-speaking, highly developed countries (particularly, but not exclusively, the United States). The results from studies conducted in Australia and New Zealand are rarely at variance with the American studies and thus there is every reason to believe that the results of this study are applicable to the Australasian context. The same cannot be said for non-English-speaking, underdeveloped countries. In a study drawing on 52,252 primary-age pupils, 12,085 teachers, and 2,710 classes from 29 countries, Heyneman and Loxley concluded that academic achievement in low-income countries was affected more by pupils' social status and less by school and teacher quality than in the West.

Notes

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This ***set*** item is adapted from Measuring the Effects of Schooling, in *The Australian Journal of Education*, Vol. 36, No.1, 1992.

The illustrations comparing different effect-sizes to people's heights is adapted from

Cohen, J. (1977) *Statistical power analysis for the social sciences*, New York: Academic Press.

Many textbooks detail how effect-sizes can be calculated from summary statistics such as *t*-tests, anovas, etc. For example see

Glass, G.V., McGaw, B. and Smith, M.L. (1981) *Meta-analysis in social research*, Beverly Hills, CA: Sage.

The work on the effects of introducing computers is in

Hattie, J.A. (1987) Identifying the salient facets of a model of student learning: A synthesis of meta-analyses, *International Journal of Educational Research*, Vol. 11, pp. 187-212.

The details about how the effects decrease with age, etc., are in

Fitzgerald, D., Hattie, J.A. and Hughes, P. (1986) *Computer applications in Australian classrooms*, Canberra: AGPS.

The full details of the computer search of *Psychological Abstracts* etc., and the work on these is in Hattie (1987), reference above.

The work on the NAEP data bank is in

Johnson, E.G. and Zwick, R. (1990) *Focusing the new design: The NAEP 1988 technical report: The nation's report card*. Princeton, NJ: ETS.

The effect of maturation as calculated by Cahen and Davis is in

Cahen, S. and Davis, D. (1987) A between-grade-levels approach to the investigation of the absolute effects of schooling on achievement, *American Educational Research Journal*, Vol. 24, pp. 1-12.

That students spend 66 percent of their time working alone is detailed in

Rosenshine, B.V. (1979) Content, time, and direct instruction. In P.L. Peterson and H.J. Walberg (Eds.), *Research on teaching* (pp. 28-56). Berkeley, CA: McCutchan.

That the aim for teachers should not be to implement everything is discussed in

Levin, H.M., Glass, G.V. and Meister, G.R. (1987) A cost-effectiveness analysis of computer-assisted instruction, *Evaluation Review*, Vol. 11, pp. 50-72.

Research suggesting that schooling makes very little difference can be found in

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The work of Lee and Bryk critical of that research, and a discussion of hierarchial linear models is in

Lee, V.E. and Bryk, A.S. (1989) A multilevel model of the social distribution of high school achievement, *Sociology of Education*, Vol. 62, pp. 172-192.

Systematic investigations of how schools work include

Barr, R. and Dreeben, R. (1983) *How schools work*, Chicago, IL: University of Chicago.

and

Creemers, B.P.M. and Scheerens, J. (Eds.) (1989) Developments in school effectiveness research, *International Journal of Educational Research*, Vol. 13, pp. 685-825.

and

Rutter, M., Maughan, B., Mortimore, P., Ouston, J. and Smith, A. (1979) *Fifteen thousand hours*, Cambridge, MA: Harvard.

The idea that education is judged by inappropriate criteria comes from

Broudy, H.S. (1988) *The uses of schooling*, New York: Routledge.

For the Cobb-Douglas function see

Walberg, H.J. (1981) A psychological theory of educational productivity. In F.H. Farley and N. Gordon (Eds.), *Psychology and education* (pp. 81-108). Berkeley, CA: McCutchan.

The class size meta-analyses can be found described in The Class Size Issue Rides Again, in ***set***, No.1, 1980, item 9; and in

Glass, G.V. and Smith, M.L. (1979) Meta-analysis of research on class size and achievement, *Educational Evaluation and Policy Analysis*, Vol. 1, pp. 2-16.

How the factors leading to success differ in third world schools can be read about in

Heyneman, S.P. and Loxley, W.A. (1983) The effects of primary-school quality on academic achievement across twenty-nine high- and low-income countries, *American Journal of Sociology*, Vol. 88, pp. 1162-1194.

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item 5

set
number two 1993

Listening
WHAT OUR PUPILS TELL US

Susan Gray
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Introduction

YOU OFTEN HEAR IN THE STAFFROOM – 'They look as though they're listening but they don't take it in.' And on school reports is written 'Needs to develop listening skills.' But teaching the skills of listening is rare, certainly in secondary classrooms. As teachers we often assume that, by the time they are 13, all children can listen and understand. However, this is by no means always so and some reflection, a little testing, and action can benefit all our students.

Listening is a 'covert' activity – the process of successful listening is difficult to uncover and measure. However, I had some success, with 13-year-olds in mainstream third form (Year 8) English classes in which some of the children spoke English as their second language. The research looked at what listeners do while listening. I hoped that being the guinea pigs for the research would raise the students' awareness of their own listening and that the results would show teachers the need to further develop listening skills.

The Research

After listening to three short Greek legends (about Hades, Arachne and Artemis) on tape and then writing down what they remembered, the students commented. They answered two questions: 'What helped you listen and remember?' and 'What was going through your mind as you listened to the stories?'

Responses to Question 1: What helped you listen and remember?

The responses to the first question showed up external and internal factors.

The **external factors** that helped the children listen and remember were:

- quiet;
- clear speech;
- how interesting the story was;
- how the story was written;
- key words;
- the names of the characters (which had been written on the blackboard);
- pictures (which had been supplied);
- a good reason to listen;
- the speed the story went at.

The **internal factors** they described fitted into the stages of listening comprehension described by O'Malley and colleagues in *Listening Comprehension Strategies for Second Language Acquisition.*

1. Controlling emotional and/or physical factors:
   - not being nervous or tired or in pain or hungry.
2. Focusing on attending and concentrating:
   - blanking away distracting thoughts;
   - not gazing out the window;
   - focusing on something.
3. Organizing what they hear in some meaningful way for themselves:
   - making pictures;
   - acting out the story in my mind;
   - differentiating the main points;
   - putting bits into categories;
   - being one of the characters.
4. Utilizing this new knowledge, which is added to existing schemata:
   - associating Arachne with arachnophobia;
   - relating it to similar stories in this situation.

For the purpose of analysis, the students were grouped according to how much they had remembered of the legends. First language and 2nd language students were represented in all groups.

The bottom group (that is, those who had remembered least) reported that they depended on the aid of external factors. While some were coming to grips with a new language, others were overcoming the hurdles of controlling negative affective and physical factors. If they could do that, their next preoccupation was to focus on attending and concentrating.

In contrast, the top group of listeners (those who had remembered most) reported using, whilst listening, a wide range of cognitive strategies which helped them to organize the input in some meaningful way. These strategies included:

- rehearsal (repeating the story in my head);
- constructing the story for myself;
- making images.

While listening some students were even recalling their previous knowledge of Greek legends.

These students were actively engaged in listening. Rabinowitz and Chi describe listeners such as these as either having more prior information available, or as having that information better organized to allow access and recall.

Responses to Question 2: **What was going through your mind as you listened?**

Those who listened well had their anxieties under control. They said, for example, 'First I was trying to remember and then I relaxed'. Other answers reinforced the notion that the effective listener is an active constructor of meaning – they had strategies which helped them process the incoming data such as:

- I repeated it slowly in my mind after it was said.
- I asked myself questions 'Who were the gods?'
- I thought about what the scene looked like.
- I asked myself what happened first, second, third?

They also had a framework of expectations which matched the task. For example, they said:

- The main plot of the story was playing in my head.
- There were key words that I picked out from each paragraph.
- How realistic, and predictable, these sort of stories are!

These effective listeners also reported making their own meaningful mental representations

- I was imagining the story as pictures.
- There were pictures and thoughts that the story triggered off in my mind.
- I got images. I could actually see Hades on his chariot.
- I was making a picture of what was happening.

By comparison, the ineffective listeners reported thoughts which showed they were having difficulty getting to the first stage of listening, 'attending and concentrating'. They were besieged by distracting thoughts and feelings which they seemed unable to control. Some examples of these:

- I was thinking whether different cultures are better at remembering because my Hong Kong friend thought the hard story was easier.
- I found myself thinking about things – my worries were everywhere else but I tried hard to remember.
- I wondered about all the different names you could call a dog.
- I was thinking about food and games.
- My life is a living hell.
- I thought about the first sentence.
- I try to think of a picture of the stories, so some pictures go through my mind.

Follow up

Students who have been part of classroom based research deserve to hear and benefit from the results. In a follow up visit I presented them with the following techniques that effective listeners use when listening to stories.

1. Blank away distracting thoughts.
2. Predict what the story might be.
3. Take notes in your minds of important details.
4. Associate something from the story with things you already know e.g., Arachne/arachnophobia.
5. Imagine a picture of the story in your mind.
6. Organize the story as different scenes of a play in which you are taking part.
7. Keep your attention from wandering (out the window...).
8. Repeat the words of the story over in your head during the pauses.
9. Ask yourself questions as the story progresses 'Who are the gods?' 'What does the scene look like?'

The students' enthusiastic discussion showed how valuable the exercise had been. They were genuinely interested in what had been going on in their classmates' minds. Thomas, a very skilled listener said of rehearsal-repeating 'but that's what I do, Miss, and I thought I did it because I was dumb'. Many were sure they had never been taught about listening. They responded positively to exercises in which the skills of listening were made overt. They had started to become aware of their own listening behaviour.

Conclusion

As classroom teachers, we need to:

- Assess the listening capabilities of the students in our classes.
- Actively teach listening, in particular, give explicit practice in *transactional* listening. Research shows that
  - improved listening results in improved reading;
  - good listeners in primary school become good learners in high school.
- Encourage students to be reflective about their own language skills and their progress. *Ask not only,* 'what did I learn today?' *but,* 'did I learn about learning?'
- Understand the importance and nature of the listening process; and then develop appropriate resources in our subject areas to support this understanding.

The final word about listening is from one of my students:

> *I didn't know you could improve your listening. I thought you were just born with it.*

Notes

MS SUSAN GRAY teaches at Selwyn College, Kohimarama Road, Auckland. This research was completed as part of the Diploma in English Language Teaching in the English Department, University of Auckland, 1991.

For those wishing to pursue this topic, Susan Gray's research report, *Listening – Overlooked and Undervalued*, is lodged in the University of Auckland Library and may be interloaned.

The stages of listening comprehension can be found in
O'Malley, J.M., Chamot, A.U. and Kuper, L. (1989) *Listening Comprehension Strategies in Second Language Acquisition in Applied Linguistics*, Vol. 10, No. 4, pp. 418-437.

That being a good listener requires prior information or information better organised is spelled out in
Rabinowitz, M. and Chi, M.T.H. (1987) An Interactive Model of Strategic Processing. In S.J. Ceci (ed.) *Handbook of Cognitive, Social and Neuropsychological Aspects of Learning Disabilities*, Vol. 2, Hillsdale, N.J.: Erlbaum.

The quotation *Ask not only* 'what did I learn today?' *but,* 'did I learn about learning?' is from
Lewis, M. (1991) What is the Curriculum for ESOL Learners? In *Many Voices*, Vol. 2, pp. 7-12, May 1992.

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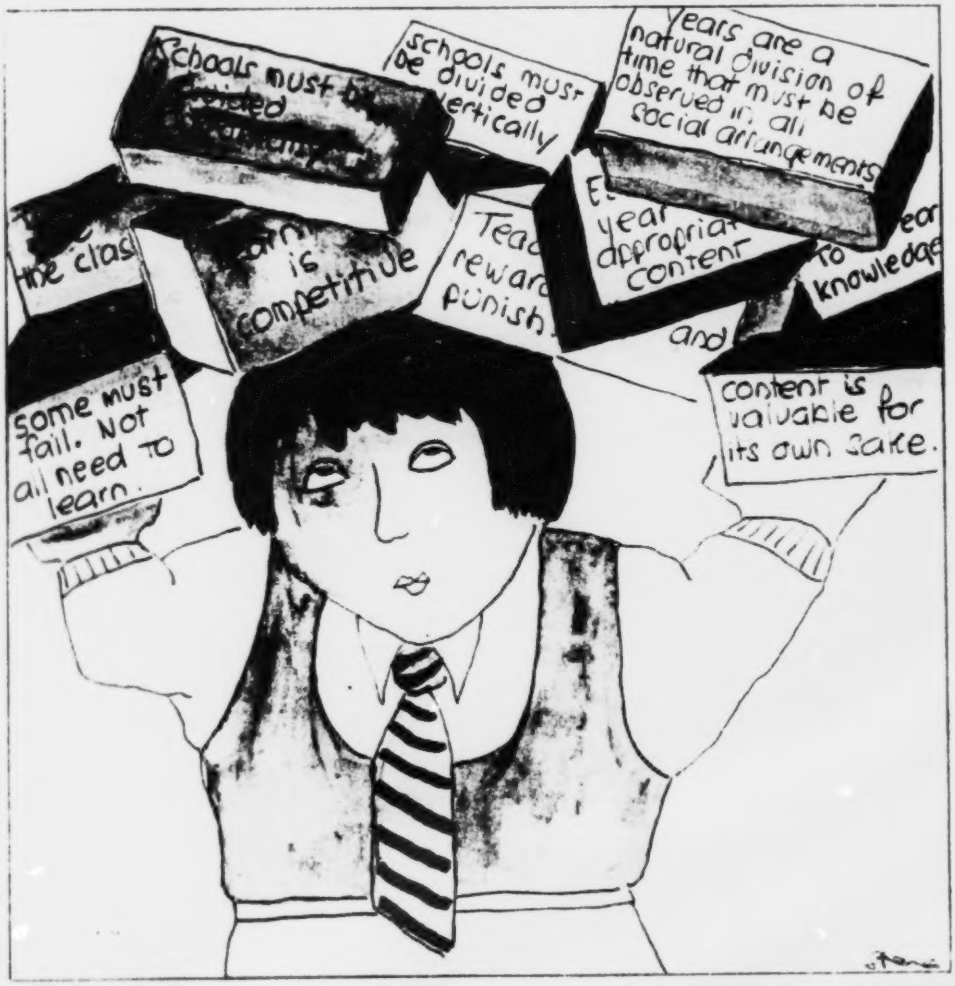
item 6

set
number two 1993

Questionable Assumptions Underlying Secondary School Classrooms

Richard White
Monash University


Schools must be divided
schools must be divided vertically
Years are a natural division of time that must be observed in all social arrangements
the clas
is competitive
Teac reward punish
year appropriat content
and
To knowledge
some must fail. Not all need to learn.
content is valuable for its own sake.

Shona McLean

THIRTY SIX YEARS AGO Freeman Butts ran a keen American eye over Australian education and, with precision and tact, described assumptions that drove our systems of administration and control, our curricula and syllabuses, our teaching methods, and our ways of training and organising teachers.

Butts was concerned with the education system as a whole, and did not concentrate on what happened in classrooms. However, he did observe Australians assuming that 'formality, orderliness, discipline, quiet, and efficiency are the best outward signs of good classroom procedure'. He saw that the questions asked by teachers were demands for recalled information, about knowing rather than thinking; that there was little training in judgment; and that understanding was subordinated to the need to cover a certain amount of content.

How do things stand today? I see 15 assumptions inhibiting good education. They arise in part from experiences not open to inspection by others, such as my time as a high school teacher, which included a particularly rewarding period when I taught the same people for five years in succession; from many conversations with teachers, students, parents and academics; from observations of lessons; from Higher School Certificate examining; from involvement in curriculum committees. Other assumptions are easier to check on – including those arising from analyses of tapes and transcripts of lessons; from statements in published courses of study and external end-of-school examinations; from studies of students' perception of school (particularly those of school climate and discipline) and studies of teacher stress.

Probably the strongest factor in my selection of assumptions is research with which I was associated on the quality of learning. The first phase of that research evaluated students' understanding of scientific principles and natural phenomena; the second phase involved probing of learning styles and attempted to make students more purposeful and effective learners.

Organisation

Assumption 1: Schools must be divided horizontally

Almost all secondary schools group their students into year levels called 'grades' or 'forms', within which there is typically no more than 12 months separating the oldest from the youngest. This practice has been followed for so long that it is no longer thought about, and indeed many people may find it difficult to comprehend that different practices are possible.

Although it is sensible for people to share experiences with others of the same age, it is not necessary to exclude them from sharing experiences with people of different ages, as we now do. Of course they need some contact with peers, but a handful in a group might do as well, or even better for social purposes; say 4 students of each year of age from 12 to 17. Interactions would occur in a social group more like those of out-of-school life.

In a diverse-age group, younger students can learn from older ones, as well as from the teacher. Teachers cannot tell adolescents how to grow up, but adolescents can (and of course do, outside classrooms) learn from watching those a year or two ahead. Some say older adolescents will be poor models. This suggests a stultifying pessimism about youth and assumes that schools are controlling, rather than nurturing institutions. In fact, in mixed age groupings the older students feel the responsibility of their role and work to keep the respect of their juniors.

Much misbehaviour in school is caused by the competition for social prominence that is accentuated by the present levelling of ages within each class. It is showing off, in other words. At present the teacher is the target of indiscipline, and can get little help from the class in suppressing it. It would be altogether different with a range of ages. An oafish act by a 14-year-old would be as likely to be suppressed by the 17-year-olds as by the teacher, and in any case would not be committed if the 14-year-old knew that older students saw such acts as juvenile.

Older students can serve as models for younger, for intellectual development as well as social. An often-stated goal of schooling is getting students to learn how to learn. With uniform-age classes it is difficult for them to do this. Each class is left to discover strategies for learning. This is pretty inefficient, and indeed ineffective, as investigations of learning styles show. The more able students are the ones who eventually find out for themselves how to reflect on information, how to question and postulate, how to link new facts with old, and all the other skills of learning. By the time they have developed these it is too late for their peers to copy them. There would be time if, from the moment they began secondary school, students were in the presence of older learners. Skills of learning would be handed on.

Assumption 2: Years are a natural division of time that must be observed in all social arrangements

The horizontal division of schools is associated with their organisation on a basis of years. Administrators, teachers, students and parents think in years. A recent suggestion in New Zealand would imbed this thinking in a set of names for school groupings, calling them Year 0 to Year 12, as already established in Australia. Schooling is not seen as a continuous experience but as a series of starts and stops. Each segment of the series is organised more or less independently, so that classes are re-formed, and re-numbered, every 12 months, and relations between student and teacher, and even student and student, are broken.

Consequently the beginning of each school year is a period of exploration, with teacher and students finding out about each other's personalities and establishing scripts for behaviour, and the teacher finding out what the students know about the subject in hand. It is not an efficient period.

Assumption 3: Schools must be divided vertically

Almost all secondary schools organise their days into blocks of time called periods, typically from 35 minutes to an hour long. Each period is given over to a particular subject, and each subject is taught by a teacher who specialises in it. Although teachers may each teach more than one subject, they are limited in their range and are specialists rather than generalists. They are trained for specialism, with the bulk of their preparation being in the acquisition of specialist subject matter and teaching methods thought appropriate. Thus knowledge is presented in discrete packages and is learnt that way, in unrelated isolated blocks, when better understanding, creativity and retention would come from perception of links between different fields of knowledge.

It is not only the students who are affected. Specialisation has a narrowing effect on teachers, often without any compensating development in depth of knowledge. Few science teachers, for instance, can tell how economic and political changes have influenced the development of their subject, and few history or English teachers know how science has formed theirs. Specialisation in schools inhibits growth.

An inevitable consequence of specialisation is that relations between teacher and student are weak. In primary schools, the teacher works with 20 to 30 children and gets to know them fairly well. The children may see a couple of specialists, such as a music teacher, but relate mainly to the one teacher in the year. In the vertically divided secondary school, it is common for a teacher to see in a year a total of 200 or more students, and 300 or even 400 is not unknown. Vertical division is connected with further assumptions about the nature of teaching and learning, which are discussed in the section on content (Assumptions 10 to 13).

Assumption 4: Learning is competitive

Most pupils say there is a lot of competition between pupils in their class – 71% of boys and 68% of girls say so. Many people defend competition in classrooms, despite evidence that there is greater achievement in cooperative classes. Schooling is preparation for life, they say, and, because life is a struggle, school should be one too. This is a simple argument, and therefore attractive. People like simple arguments. But is it really sound?

Superficially it does seem that society is competitive. Newspapers are full of the results of sporting events and of the doings of people who have scrambled for power or for more money than they could possibly need. However these instances of competition are seen against a pervasive background of co-operation. By definition a society is a set of co-operating people, which for good reasons uses laws and regulations to constrain individuals who want to compete to a dangerous degree. Further, much of the apparent competition is superficial or illusory.

An analogy is often drawn between social life in general and sport. Sport, however, is organised so that it is not truly competitive. Mostly it is arranged so that everyone gets a share of winning. If it were not, few would take part in it. We have handicaps in golf, so that if you play badly enough eventually you will be given a mark from which you can win, whereupon you will be handicapped down again to let someone else have a turn. Competitions are arranged in grades, so that when you lose in B grade you drop back to C, and can win there. And in each team there is intense co-operation. Adults *choose* the grounds on which they will compete, if at all. I am not a good runner, so I do not enter races and it does not concern me that someone else wins them. Nobody forces you to grow tomatoes to try to win a ribbon at the Show.

Competitive learning in school lacks the softening features of competition outside. The student can refuse to compete, but is still entered in the learning race and given a result. Handicaps are not used to even out the chances. The student can be put in a lower stream, but in the external exam is given the same test as those in the higher streams and gets lower marks. Diversity of choice is low; higher in the school there is more choice of subjects, but the same sort of competition exists in all and the same sorts of abilities are rewarded.

In fact society depends more on co-operation than on competition and much of the apparent competition is superficial and managed. The argument that learning must be competitive to mirror society fails. It should fail also because it leads to unsatisfactory outcomes. Because examination results are valued, students compete for good marks and we get as a result the learning equivalent of anabolic steroids in athletics – cramming for the test. Content is learnt for reproduction, not understanding, is not valued for its own sake, and is forgotten soon after the test. Permanent damage is done to learning style as, instead of learning to become independent learners, students learn how to pass examinations.

The assumption that learning is competitive refers to competitions against others. It would be less harmful, even beneficial, if it meant competition against oneself, so that there was a drive to learn more and more in order to become a more fulfilled and competent person. Unfortunately it is clear that our tests are normative; that is, they are rankings of students against each other and not measures of individual growth. The normative nature of tests is connected with the next pair of assumptions.

Assumptions 5 and 6: Some must fail. Not all need learn

A large manufacturing company that discarded 40 per cent of its products from the assembly line before they reached the final inspection point, at which a further 20 percent were graded as unsatisfactory, would soon have restive shareholders. Yet the shareholders in education – governments, parents and students – have tolerated for many years an equivalent lack of efficiency in secondary schools. The justification is that standards must be kept up. This justification involves further assumptions that, even when as much as possible is done to improve the raw material, much just cannot be brought up to standard, and that the function of secondary schools is to select them out rather than prepare them for life.

Bloom mounted a determined attack on these assumptions. He wrote persuasively about techniques that would see 95 percent of students doing as well as 'A' students do now. Many research studies showed that his mastery learning techniques were effective. Popular books such as *Mastery Learning: Theory and Practice* spread the news, and even the chronic insulation of teachers from new developments could not keep many from hearing about mastery. Despite the publicity and the appeal of Bloom's notion, mastery learning made hardly any inroads on secondary school practice. The techniques require more time, resources and energy than over-pressed teachers have; Bloom's definition of mastery was vague, and tended to lead to trivial tests; the theory did not take into account students' motivations and needs. Perhaps the most influential reason is the set of widely held assumptions that learning is competitive – some must do well, some must fail.

These assumptions combine with the perception that schooling is principally concerned with preparation for a job or for further study. Solman found that teachers, parents, students and past students rated personal development much lower as an issue for schooling than subject matter or employment. Solman's result is confirmed by a national poll in which people were asked what schools should concentrate on teaching: skills needed for work got twice as many votes as knowledge about life and society. The belief is very strong in New Zealand, as witnessed by recent government policy statements. From the belief that schools should concentrate on work skills it follows that, since some people are needed for menial tasks that require little knowledge, not everyone need learn.

Teachers' practice conforms with the assumptions that some must fail and not all need learn. This is evident in the tests that they construct; the ranges of marks they accept as normal; in their minute-to-minute conduct of lessons. Lundgren observed that teachers use 'marker' children in deciding when to move the class on to the next point. The marker children are those whom the teacher ranks as near, but not at, the bottom of the class, say about four-fifths of the way down. When these students appear to grasp the point, the teacher moves on. The bottom fifth take their chances.

Can anything be done about failure? Only if further assumptions are overthrown.

Management

Assumption 7: Teachers rule the classroom

A classroom is a feudal estate with one lord, the teacher, who controls not only discipline but what is to be learnt, and how and when. The students' responsibility is limited to behaving as the teacher directs.

This is so imbued an assumption that many people imagine that the only alternative is anarchy. It is rather pathetic that this should be so for citizens of a democracy; but it is only about a hundred years since democracy was considered wrong-headed and positively dangerous, and schools have not changed all that much since then.

There is much evidence that teachers dominate. One has only to look at the standard arrangement of furniture in classrooms to see that it is geared for communication from teacher-to-student, rather less for student-to-teacher, and hardly at all for student-to-student. The students are seated so that they face the teacher; the teacher has the easiest access to the room's means of written communication, the board and the overhead projector. The expectation is that, when the teacher talks, the students listen. Talk between students is at most tolerated, not encouraged.

After analysing the practice of many classrooms, Flanders, in 1970, formulated a **law of two-thirds** – talk fills up two-thirds of the time in the classroom, and two-thirds of that talk is by the teacher. Transcripts of lessons in 1990 show that students still say little out loud. When they do it is more often than not in response to an initiative by the teacher, a question or a command. When it is something initiated by the student, it is usually a question about management which assumes that the teacher rules: 'Can I go to my locker to get my book?' 'What should we do when we have finished?' That acceptance is not given entirely freely, as countless little acts of disobedience demonstrate every day. Australian pupils were asked to respond to, 'I am not trusted to work on my own.' 73 percent of those in Year 9 (NZ form 4) agreed; 82 percent of Year 12s (NZ form 7) agreed.

The teacher's dominance of the classroom is not shared with a colleague. Team teaching happens so rarely that many teachers complete a career without ever sharing a lesson. It is uncomfortable to teach in the presence of another adult, at least at first. However, teachers at Laverton High School have come to accept and indeed welcome visits from colleagues. Perhaps it is pertinent that the Project for the Enhancement of Effective Learning (PEEL) at Laverton encourages co-operation and involves abandoning several of the assumptions questioned here. *Teaching for Intellectual Independence* by Mitchell and Baird, describes the project.

The drawbridge to most classroom castles is pulled up to discourage visitors. It also keeps out ideas. It is difficult for new teaching methods to enter. It is difficult, too, for ideas about content to enter, so that students find much of what they learn is not relevant to their lives outside school. 'I can learn [in this class] what I need to get by in life.' That got 60 percent agreement by those 14-year-olds, but only 25 percent agreement by 17-year-olds.

Assumption 8: Teachers must reward and punish, but must not reward and punish

In all social systems, control is exercised by rewards and punishments, so it is implicit in the assumption that teachers rule, that they must reward and punish. The dilemma for teachers is that, though the community still expects them to maintain control, its values have shifted so that simple methods of reward and, especially, punishment are no longer available to them.

Teachers have few concrete rewards in their gift. There are invented rewards, like koala stamps, gold stars, and credit points, but these are rather like currency issued to prisoners of war – hard to cash in for something useful. There is approval, in the form of encouraging words and kindly smiles, but for these to be rewards the student must value them. The teacher must first win the student's respect and maintain it through thick and thin. Respect is hard to gain, easy to lose.

Teachers used to have more powers of punishment than they do now. Corporal punishment, lines and detention used to be freely administered. Mercurio's compelling study in 1972 of caning in New Zealand shows how corporal punishment was accepted as a necessary, even valuable, part of school by teachers, parents and students. That is one assumption that has gone; it went by law, following the spread of more enlightened views; the governments that passed the law, and the communities that supported it, have not, however, taken away the burden of control from the teacher nor have they taken action to replace corporal punishment with a humanitarian alternative. Schools have searched for and developed their own discipline systems, many of which are effective. Many adopted Glasser's ten-point procedure, though they received little help in how to apply it. Glasser's step of sending a recalcitrant student to a 'time out' room tends to be used earlier in an interaction between teacher and student than it should be, and full suspensions are, at least in New Zealand, growing apace, and given most, out of all proportion, to Maori children.

In practice, teachers carry their responsibility for control with few means at hand other than their own personalities, often with unfortunate results. Lewis and Lovegrove found that a majority of 14-year-old students said that their teachers used embarrassment as a means of control. Over 80 percent said that when they misbehaved their teachers did not remain calm but yelled at them.

Schools do operate smoothly in the main, because of the quality of teachers and the good sense of most students. However the lack of means of control puts teachers under strain. 'Teacher stress' has become well publicised in recent years, and a topic for sociological and psychological study. It is a serious management issue for governments, even if not recognised, because it leads to absences, illnesses, resignations and early retirements that cost state systems tens of millions of dollars annually. A more important concern is the misery that stress causes to human beings, to the teachers directly and to their families and their students. Those consequences make it urgent to question the assumption that teachers must, yet must not, reward and punish, and to search for alternative practices that would make it unnecessary.

Assumption 9: There are good teachers and bad teachers, and this is a characteristic independent of the context of schooling

The present system (30 or more teachers in your high school days) could be replaced by having only 3 or 4. The argument against that is that some teachers are bad teachers and it would be terrible to have so much time with a bad one. This assumes that nothing can be done to change the quality of a teacher, either by improvement or replacement.

Students and parents often grumble but put up with poor teaching for much longer than they should. Parents do not suffer the teacher's shortcomings directly and the pupils have the poor teacher for only a fraction of each week. This encourages the system to tolerate the unsatisfactory teacher, and hides the long-lasting damage that even limited exposure to bad teaching can cause.

If parents and students knew that they were going to have a much more extensive relationship with a teacher, they would not tolerate poor performance; they would demand that the teacher improve or be replaced. It is probable that if teachers spent longer with the same students they would either improve or depart of their own accord; the present system allows poor teachers to escape several times a day from disastrous situations they have got themselves into – more teachers than boxers have been saved by the bell. Much of the cause of poor teaching lies in the system that prevents students and teachers from getting to know each other well.

The present system is fatalistic and accepts mediocrity, saying it is inevitable, defending itself.

Content

Assumptions 10 and 11: To learn is to acquire knowledge. To teach is to cover content

Learning includes the acquisition of knowledge, but it is limiting to think that it is no more than that. On the many occasions when I have asked a student, 'What did you learn today?' the answer (when I got one with any detail at all) was almost always about the subject matter: 'We learnt about the Houses of Parliament' or 'We learnt how to multiply decimals'. Teachers' answers to 'What did you teach today?' are consistent, for they, too, tend to be about content. This suggests that students and teachers think of learning as primarily, perhaps entirely, the acquisition of knowledge, and that knowledge consists of facts and algorithms (rules for dealing with facts).

Syllabuses give the same impression. Though they may have a preamble that says the aims include students developing a liking for the subject and an appreciation of its importance for their lives, the bulk of detail is names of topics, each of which is taken to stand for a collection of facts and ways of dealing with them. Texts, too, and transcripts of lessons, reinforce the notion that knowledge of facts and algorithms is all that matters.

Syllabuses and texts reflect a simple notion that learning is merely the addition of information to one's store of knowledge. Along with this goes an equally simple notion that teaching involves no more than (1) control the learner's attention, (2) make a clear statement of the fact or a clear breakdown of the algorithm, (3) drill to ensure that it sticks in the learner's mind. It is strange that such simple models persists; brief reflection on our own schooling makes us realise that very little of the detail 'taught' to us in secondary school can be brought to mind.

Other types of knowledge

What else is there to learn other than facts and algorithms? I can think of half a dozen types of knowledge: (a) propositions – including facts but also less widely accepted statements like opinions and beliefs; (b) intellectual skills – being able to perform whole classes of tasks including algorithms; (c) strings – things learnt by heart such as proverbs, poems, mnemonics and multiplication tables; (d) images – which are mental pictures or other imagined sensations, such as the vision of a knight in armour, the sound of running water, the smell of newly baked bread; (e) episodes – recollections of experiences like the time you climbed Ayer's Rock; (f) motor skills; (g) cognitive strategies – broadly applicable skills that make up our mental abilities, such as being able to plan, to evaluate alternatives, to keep one's mind on the task, to sort out the important things from the irrelevant. These hardly ever appear in syllabuses. Their acquisition is left to the chance of the moment.

Learning also involves the synthesis of separate elements of knowledge. This leads to understanding and to new attitudes. Neither is simple to describe, yet both are important parts of learning and both are important aims of teaching. Perhaps it is because they are such difficult concepts to describe and measure that teachers and learners tend to speak of the simpler tasks.

Learning and unlearning

Learning theories need to be expanded in at least two ways. First, it has become apparent from recent research in science education that understanding often requires **unlearning** as well as learning, where new knowledge conflicts with old. For instance, biology students can acquire propositions about evolution while retaining conflicting Lamarckian propositions that they had previously formed for themselves. A top teacher would want to check on those pre-existing beliefs and devise means of getting the students to reflect on the conflict with new information and resolve the discrepancy. It is not a trivial task to get people to abandon established beliefs. New knowledge is often a veneer that is sloughed off as soon as the need for it, such as an examination, has passed. As yet we do not have effective principles of learning and teaching that deal with unlearning.

The second way in which learning theories should be expanded is to take account of attitudes and self-concept. To form and change beliefs, about other things and about yourself, is an important part of learning. Often that will involve unlearning. In class the formation of attitudes and self-concept is largely left to chance.

The development of cognitive strategies should also not be left to chance. An example is the strategy of directing to oneself questions such as 'Do I know what I am supposed to be learning?' 'Why am I learning it?' 'Do I understand it well enough to stop?' Another strategy is to search for links between new information and older knowledge. Students who lack these skills are doomed to poor understanding of the content that passes before them. They are labelled as lacking in ability (as indeed they are) but they can be helped by good teachers. Good teachers provide that training unconsciously; superior teachers deliberately.

Unfortunately the development of cognitive strategies takes a long time, and the horizontal and vertical divisions of secondary school (Assumptions 1 and 3) prevent any one teacher from providing total effective training. The only way is for one teacher to spend more time with a class, as occurs in primary schools, or a group of teachers must make a co-ordinated, systematic effort to promote good strategies. The PEEL project, running since 1985, fully demonstrates this.

Assumption 12: **Each school year has its appropriate content**

Since it keeps recurring, it is apparently an attractive notion that there are ages, or stages, when children are 'ready' to learn particular things. Back in 1939 the American Committee of Seven linked ages with skills, and was so influential that, even in the 1960s, a textbook stated that no child could learn to read before reaching the mental age of six years and three months. Consideration of the difficulty of determining just what 'learning to read' means and of the tests used to measure mental age should have made it obvious that this was nonsense.

Bruner countered the readiness argument, writing, 'We begin with the hypothesis that any subject can be taught effectively in some intellectually honest form to any child at any stage of development'.

There is a near-universal practice of setting out the curriculum with topics to be covered each year. One reason for this is the ingrained belief in readiness. Another factor is that it is easier to treat all learners in a class as one, and not take into account their different interests and rates of maturing. The effect, for each student, is that particular topics are presented in particular years, whether or not the student is interested in them at that time, whether or not he or she has previously acquired sufficient other information and skills to be able to make sense of it.

If the topic is not learnt when it is presented, then the child has another hole in his or her knowledge, and that will cause further trouble later. Losses in learning cumulate at an increasing rate. This is the major reason why very many noisy employers observed in the 1970s a surprising proportion of students entering the work force unable to read and without basic arithmetic skills. I had noticed before that, in the 1960s, the same children entering secondary school unable to handle basic skills. They had come from the large primary classes of the day, and many had missed important chunks of vital early learning.

Secondary schools are not well equipped to cope with students lacking basic knowledge and skills. They can run remedial classes, but the general attitude seems to be that it is anomalous that such skills need to be taught in high school. The attitude reflects an assumption that all people of a particular age will, near enough, be equally ready. This very questionable assumption leads to practices that actually deny the notion of readiness. Content is determined with little consideration for the actual knowledge and skills of the children, let alone their interests and abilities. Certainly they are not consulted about it. One serious result is that students conclude that learning is imposed on them. Learning is done *to* you, not *by* you. Learning is not your choice, nor your responsibility. Consequently it is not something that many will continue to do throughout life.

Assumption 13: Everyone in a class should learn the same content

Every now and then there is a move to reconstruct the curriculum. This is usually because of political pressures; for, when a nation is doing poorly, education is the final scapegoat. So pressures come for students to learn more mathematics or science, or English, or history, or Japanese – whatever is perceived to be the need of the time. That is quite sensible, since national needs do shift and the education system has a responsibility to meet them.

Unfortunately curriculum changes are then restricted to changes in amounts of time and content. It is rarely recognised that teaching more of a subject does not necessarily produce more learning of it. That lack of recognition is tied to two assumptions – the one discussed in the previous section, that each year has its appropriate content, and the associated one, that everyone in a class should learn the same content.

These ideas are tied more to tradition than to purpose. Our society is complex, with so many diverse roles for people to fill that beyond basic literacy and numeracy, we run quickly into argument about detail. Should everyone learn how to solve simultaneous equations, the law of the lever, the themes of *The Merchant of Venice,* how to speak French, the history of the European exploration of Australia or New Zealand? Few members of the community currently know much about these things. A core curriculum for secondary schools is an illusion. There is no way of determining it from considerations of national need.

The argument that there is no core beyond literacy and numeracy is not a call to concentrate on basics – on the contrary, the national need is always for a broadly educated, informed, alert and thoughtful populace. There is, however, no need for all the people to know the same things. Complex societies in turbulent times are better placed to survive when their members have diverse skills and knowledge. Therefore, we should encourage students to learn, and to learn different things, following up their own interests. That is not easy to do when all the students in a class are locked into the same progression through the same subject matter chosen for them by the same someone else. Everyone in the class learning the same content is a convenience to suit the teacher, not the learner. The teacher-centred lessons of secondary schools are a continuation of the lessons given to huge classes in the primary school in the 1800s. Is that style of lesson sensible and appropriate for the functions of secondary schools today? It is time to consider better practices; perhaps to encourage great variety in what is going on in the classroom at any time. Though difficult to devise, such practices would meet current needs better.

Assumption 14: Content is valuable for its own sake

Much of the content in secondary school syllabuses is there because it might be wanted in order to learn more of the same sort of knowledge later on. Knowledge has become important for its own sake. There is nothing wrong with that: curiosity, the drive to know, is a vital human characteristic; people like to learn trivial facts, and like to acquire recreational skills. They like to choose them for themselves, however. Many students react against schools, not because they are centres of learning but because the knowledge that is taught there is imposed on them, not chosen by them, and they perceive that the imposed knowledge is not only uninteresting but also irrelevant to their needs.

Recent research on the learning of science abounds with instances of the abstract nature of the knowledge that is taught. One classic problem is to ask people to arrange a battery, globe, and wire so that the globe lights. This task has been given to secondary school students in Sweden and engineering college students in the United States (who might be expected to find it trivial.) The results are depressing. Many of the people failed at the task. In another example, Robert Gunstone and I interviewed science graduates to find out what they knew about gum trees. Nearly all had studied some biology, and several had majored in it. Most had a poor knowledge of gum trees, but what appalled us most was to find that **half** did not know that gum trees flower. Poor learning? Poor teaching? They certainly had not learnt from their long study of science to look at the world around them and to reflect on what they saw. Their science was facts learnt from books, not bad in itself but sad when not linked to real things.

Similar deficiencies can be found in the learning of other subjects. For example, many secondary school students are made to learn French. There are good reasons for people in England to learn French, but it is hard to get Australian students to accept any. Their lack of opportunity to use French as a real language reduces the subject to an intellectual game, abstract and irrelevant to their lives. Consequently nearly all of the effort put into it in schools is wasted.

My argument is not that nobody should learn esoteric mathematics, abstract science, history, or French, but that no one should be **made** to learn them. There should be **opportunity** to learn, not **compulsion** to swat. Compulsion does not produce useful learning, and tends to discourage all learning. It promotes unfortunate learning habits. School is seen to be about school, alone.

Assumption 15: 'They' determine content

Students are not the only ones who believe that they have little control over content. Teachers, too, feel that they have little independence, despite the dismantling in Australia of the system of externally controlled school examinations in all years but the final one. John Baird has described a real teacher involved in a lengthy attempt to encourage students to take responsibility for their own learning. Despite the freedom he had, this teacher kept moving on to new topics even though he knew that many of his students had not understood the current one. When Baird asked him why he did this, even though the syllabus and tests were under his control, the teacher was not able to explain clearly but apparently believed that he should 'cover' all the topics he had planned at the start of the year, even if the students did not learn well, because whoever taught them the next year would assume that the listed topics had been taught.

Teachers not only *feel* that what they are to teach is beyond their control – it often is. In Australia the Higher School Certificate (HSC) examinations still exist at the final year, and they dominate what many parents and tertiary-level teachers think the school is for. The content of courses for these examinations is, in most states, determined outside the schools and the chance for classroom teachers to serve on subject committees and influence what is prescribed is getting less. This is true in Victoria where the

VCAB has replaced the VISE and in New Zealand nowadays exam development is let to contractors rather than carried out by representative committees. The external exam content affects what is taught earlier in the school.

A second factor is the textbook. Students and teachers are accustomed to the use of a text, and may find it odd to work without one. To choose a text, or worse to have one imposed, is to surrender some control over content.

The perceptions of many teachers, whether based on real or imagined influences, amount to a view that content is determined by people beyond the control of anyone in the classroom. This view reinforces the beliefs of students that learning is something far out of their control, done to, not by, them. The view is further unfortunate in that it denies an important part of the competence of the teacher. It is an assumption that reduces the status and the quality of the profession.

Development of a new school

My purpose in attacking assumptions is to encourage a shift towards a system that would meet the needs of our society and of individuals within it better. I am looking for a system that fosters closer relations between teachers and students and that confers greater responsibility on students to manage their own learning. I have hinted at the form that such a system might take. Schooling is so complex a social enterprise that improvements evolve from the efforts of thousands. In order to improve secondary schools, we need trials in scores of schools, in which teachers, students, parents and administrators learn how to work in a new system and find out what is effective and what is not. They will all have to devise new methods; one of my own assumptions is that they are capable of doing so, an assumption supported by my observation of the teachers at Laverton High School who invented or adapted over a score of innovative teaching procedures.

The attacks on the assumptions that underpin the present system are presented as guides to the forms that trials might take. Conditions are favourable for experiment: newspaper articles and letters demonstrate dissatisfaction with the present system; monolithic departments of education are being dismembered; tertiary education is being reappraised; there is a mood for change; the teaching service is experienced, and better qualified than it has ever been; alternative schools that can serve as models for new styles are available. Useful trials can be undertaken on any scale from whole systems to single teachers. Some will require bold deviations from established forms of organisation others can be tried in present classrooms. Many are in progress now, or have recently been completed.

As an example of a bold but practical development, a secondary school might extend the increasingly popular practice of assigning students to multi-age groups for an hour or so each week to the whole of the week. This could reduce the number of teachers each student sees to about three. If an external examination at the end of schooling makes this proposal too daunting for Years 11 and 12 (NZ Forms 6 and 7), then it might be tried in the first three or four years of secondary school. Such a school or even one that clings to the present vertical divisions (Assumption 3) could follow the Steiner principle of keeping teachers and students together for several years.

Without changing the organisation of the school, desirable though changes might be, teachers could follow the PEEL teachers, combining to develop their own ways of encouraging students to learn about and to control their own thinking and learning. Even the individual teacher can try new ways of promoting better learning, such as encouraging students to ask questions or applying long-established but little-used techniques such as Gordon's *synectics* or Suchman's *inquiry training*.

The only obstacles to trials are the assumptions that maintain the present system. The only way of overthrowing the assumptions is through trials. We need to break the circle.

Butts urged Australia to make changes in the administration of schools, the training of teachers and the determination of the curriculum. Considerable changes have been made in these fields. It remains to be seen whether we can alter classroom practice to meet his final challenge: 'Dare Australians build a new school?'

Notes

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This *set* item is adapted from his paper, Questionable Assumptions Underlying Secondary School Classrooms, in *The Australian Journal of Education* Vol.32, No.3, 1988 (Special Bicentennial Edition).

The next item in this edition of ***set*** reports research in a school which is trying out suggestions made in this article. See:
Poskitt, J., McAlpine, D., Ryba, K. (1993) *Achieve* is choice. ***set*** No. 2, 1993, Item 7.

Freeman Butts' report is
Butts, R.F. (1957) *Assumptions Underlying Australian Education*, Melbourne: ACER. See page 50.

Many of the analyses of tapes and transcripts of lessons in which I found the assumptions are from such works as
Dunkin, M.J. and Biddle, B.J. (1974) *The Study of Teaching*, New York: Holt, Rinehart and Winston.
and continue to appear in *The Journal of Classroom Interaction*.

Students' perceptions of school climate appear in
Batten, M. and Girling-Butcher, S. (1981) *Perceptions of the Quality of School Life: A Case Study of Schools and Students* (ACER Research Monograph No. 13), Hawthorn, Vic.: ACER.

Students' perceptions of discipline appear in
Lewis, R. and Lovegrove, M.N. (1987) The teacher as disciplinarian: How do students feel? *Australian Journal of Education*, Vol. 31, pp. 173-86.

Students' perceptions of teacher stress appear in
Otto, R. (1986) *Teachers under Stress*, Melbourne: Hill of Content.

Two studies of students misapprehensions after studying science at school are
Brumby, M.N. (1984) Misconceptions about the concept of natural selection, *Science Education*, Vol. 68, pp. 493-502.
and
Gunstone, R.F. and White, R.T. (1981) Understanding of gravity, *Science Education*, Vol. 65, pp. 291-9.

The probing of learning styles is written up in
Baird, J.R. and White, R.T. (1982) A case study of learning styles in biology, *European Journal of Science Education*, Vol. 4, pp. 325-37.

For attempts to make students more purposeful and effective learners see
Baird, J.R. (1986) Improving learning through enhanced metacognition: A classroom study, *European Journal of Science Education*, Vol. 8, pp. 263-82.
and
Baird, J.R. and Mitchell, I.J. (Eds.) (1986) *Improving the Quality of Teaching and Learning: An Australian Case Study – The Peel Project*, Clayton, Vic.: Monash University.
and
Baird, J.R. and White, R.T. (1982) Promoting self control of learning, *Instructional Science*, Vol. 11, pp. 227-47.
but most importantly
Mitchell, I.J. and Baird, J.R. (in press) *Teaching for Intellectual Independence*, Clayton, Vic.: Monash University.

Assumption 4
The questions to pupils about competition in class can be found in
Jones, J., Kyle, N. and Black, J. (1987) The tidy classroom: An assessment of the change from single-sex schooling to co-education in New South Wales, *Australian Journal of Education*, Vol. 31, pp. 284-302.

Assumptions 5 and 6

Bloom's attack on these assumptions can be found, for example, in

Bloom, B.S. (1968) *Learning for Mastery. Evaluation Comment.* Los Angeles: University of California, Center for the Study of Evaluation of Instructional Programs.

The popular book by Block is

Block, J.H. (Ed.) (1971) *Mastery Learning: Theory and Practice.* New York: Holt, Rinehart and Winston.

Solman's study of what parents and teachers think school is for:

Solman, R.T. (1987) A survey of the needs of an urban high school's community, *Australian Journal of Education.* Vol. 31, pp. 145-60.

The national poll on the same topic was reported in

Teaching work skills comes first: Poll. (1988, 9 June) *The Age,* p. 4.

Ludgren's observation of teachers using marker children is in

Lundgren, U.P. (1977) *Model Analysis of Pedagogical Processes.* Stockholm: Institute of Education Department of Educational Research.

Assumption 7

The law of two-thirds is found in

Flanders, N.A. (1970) *Analyzing Teaching Behavior.* Reading, MA: Addison-Wesley.

The increase in children responding to teachers is detailed in

Dunkin, M.J. and Doenau, S.J. (1982) Ethnicity, classroom interaction and student achievement, *Australian Journal of Education,* Vol. 26, pp. 171-89.

Transcripts of lessons showing that children say little publicly are found in

Clarke, J.A. (1988) *The influence of the content and structure of curriculum materials and dialogue on achievement in science.* Unpublished doctoral dissertation, University of Queensland, Brisbane.

and

Theobald, J.H. (1977) *Attitudes and achievement in biology.* Unpublished doctoral dissertation, Monash University, Clayton, Vic.

and

others, not published, by Colin Power and James Butler.

The research project with questions is by Batten and Girling-Butcher, mentioned above.

Assumption 8

The compelling study of caning in New Zealand is

Mercurio, J.A. (1972) *Caning: Educational Ritual.* New York: Holt, Rinehart and Winston.

The ten-point procedure for discipline is found in

Glasser, W. (1977) Ten steps to good discipline, *Today's Education,* Vol. 66, pp. 61-3.

Embarrassment as a means of control was found by Lewis and Lovegrove, whose book is mentioned above.

Similarly the work of Otto and Owen has already been referenced.

Assumptions 10 and 11

Transcripts of lessons show that facts and algorithms are regarded as most important. See Clarke (1988) and Theobald (1977), both mentioned above.

The types of knowledge listed as (b) intellectual skills, owes its name to Gagne. See

Gagne, R.M. (1965) *The Conditions of Learning,* New York: Holt, Rinehart and Winston.

A fuller description of the types of knowledge is in

White, R.T. (1988) *Learning Science,* Oxford: Blackwell.

Learning theorists have tried to provide a more complete description of learning that incorporates understanding. See, for example

Ausubel, D.P. (1968) *Educational Psychology: A Cognitive View,* New York: Holt, Rinehart and Winston.

and

Wittrock, M.C. (1974) Learning as a generative process, *Educational Psychologist,* Vol. 11, pp. 87-95.

and

White, R.T. (1984) Understanding and its measurement. In *Research and Educational Futures: Technology, Development and Educational Futures.* Collected papers of the conference of the Australian Association for Research in Education, Perth (pp. 900-6). Perth: AARE.

and White (1988) just above.

That biology students retain incompatible ideas can be found in Brumby (1984) referenced earlier.

It is not a trivial task to get people to abandon established beliefs. See

Champagne, A.B., Gunstone, R.F. and Klopfer, L.E. (1985) Effecting changes in cognitive structures among physics students. In L.H.T. West and A.L. Pines (Eds.), *Cognitive Structure and Conceptual Change.* New York: Academic Press.

and

Gauld, C. (1986) Models, meters and memory, *Research in Science Education.* Vol. 16, pp. 49-54.

Assumption 12

The American Committee of Seven can be studied in

Washburne, C.W. (1939) The work of the Committee of Seven on grade-placement in arithmetic. In *Child Development and the Curriculum* (Thirty-eighth Yearbook of the National Society for the Study of Education, Part I) (pp. 299-324), Bloomington, IL: Public School Publishing Company.

The quotation from Bruner is in

Bruner, J.S. (1960) *The Process of Education,* Cambridge, MA: Harvard University Press.

Assumption 14

The battery, globe, wire test is in

Andersson, B. and Karrqvist, C. (1979) *Elektrisk Kretsar* (Elevperspective 2), Gotheborg, Sweden: University of Gotheborg, Department of Educational Research.

and

Johnson, D.W., Maruyama, G., Johnson, R., Nelson, D. and Skon, L. (1981) The effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis, *Psychological Bulletin,* Vol. 89, pp. 47-62.

The gum trees interviews are in Gunstone and White (1981) referenced above.

Assumption 15

Baird's case study of a teacher who had relative freedom is in Baird (1986) and Baird and Mitchell (1986) referenced earlier, and

Baird, J.R. (1984) *Improving learning through enhanced metacognition.* Ph.D thesis, Monash University, Clayton, Vic.

Development of a new school

Trials of new practice are underway or completed. See

Hannaford, B.D. (1986) *A Risky Business: Changing a Secondary School,* Marryatville, SA: Author.

and

Watts, J. (1980) *Towards an Open School,* London: Longman.

My suggestions for bold but practical development are in White (1984) referenced above.

For long established but little used techniques, Gordon's synectics and Suchman's inquiry training, see

Joyce, B. and Weil, M. (1986) *Models of Teaching* (3rd ed.), Englewood Cliffs, NJ: Prentice-Hall.

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Fredette, N. and Lochhead, J. (1980) Student conceptions of simple circuits, *Physics Teacher,* Vol. 18, pp. 194-8.

Holt, J. (1964) *How Children Fail,* New York: Pitman.

Illich, I. (1970) *Deschooling Society,* New York: Harper and Row.

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item 7

set
number two 1993

ACHIEVE IS CHOICE!

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Introduction

Achieve is an innovative educational programme in a New Zealand secondary school. The idea came from the school principal and her staff. The aim was to meet the educational needs of their students.

The students had been achieving at disappointing levels. The teachers were definitely not slacking but giving their best effort. Perhaps the system needed changing? Consequently, an individualized programme was established and university researchers were invited to be involved in a partnership of action research.

Achieve was such a success that it has continued and been expanded in this secondary school over three years and fully implemented in another. There are also partial *Achieve* programmes in several other schools in New Zealand.

What is *Achieve*?

Achieve incorporates individual programmes, self-pacing and social skill development. The school principal says that it has 8 basic assumptions underpinning it.

1. All students can learn provided that it is accepted that they need to learn at their own pace.
2. Students become more motivated to learn when they have choice over what, where, when and how they learn.
3. Students need to be taught how to plan their learning.
4. Students learn best in a mixed ability, mixed age setting when they follow individualised learning programmes.
5. Students learn as well from one another as they do from teachers.
6. Students are the learners; teachers and parents are the supporters of student learning.
7. Students of diverse backgrounds need to be taught how to relate to one another.
8. Mixed ability settings benefit students of all abilities.

The main aims of the programme are therefore:

- to give students responsibility for their own learning
- to create an emotionally supportive environment
- to develop self-discipline
- to encourage self-motivation
- to provide opportunities for students to learn at their own level using their own learning styles.

Where did *Achieve* come from?

Although the principal devised *Achieve* from her own educational theory and practice, two overseas programmes contain some similarities: The Dalton Plan in USA and the PEEL Project in Australia (mentioned in Item 6 in this issue). Individualised programmes are found in a few secondary schools, and so is some co-operative learning, but the combination of (1) an academic programme, (2) mixing wide ability groups, and (3) a simultaneous social programme, do make *Achieve* special.

A central philosophy is the concept of a triangle, with learner responsibility as one side, teacher support as another, and parent support as the third. Communication with parents was therefore an important component of the programme. Parents gave their commitment by undertaking to sign students' planning grids regularly (initially daily, but later modified to weekly), and to keep in regular contact with the school.

The Programme

Choice

The *Achieve* programme is based on student choice of **what** to learn, **where** and **when.** Each day students plan their day's work, according to timetable and menu requirements. Menus are made for each curriculum area, outlining the range of topics which must be studied during the year in order to fulfil national syllabus requirements. Students select units of work from the menus. In some subjects, such as in mathematics, pre-tests determine the level of the units the students start at. Tutor conferences, between individual students and their tutor teacher, ensure that work habits and subject balance are maintained.

Planning

Only the core subjects, Mathematics, Social Studies, Science and English are available in *Achieve*. In planning their work, students refer to *School* and *Achieve* timetables. *School* timetables ensure that students get to their various option classes, such as Physical Education, Music, Computer Studies, Maori Language and other options. The students must attend these classes in the 'main' school so they have to schedule their own work around these school commitments. In all other cases, students' determine their own pace of learning and have overall responsibility for their own learning.

Students are guided in their study by units of work. These units are usually in a folder and consist of work teachers have planned and which students work through. Often there is reading in the folder, making it self-contained, but at other times references have to be followed up in textbooks or further afield, encouraging the students to employ wider research skills. Frequently students have to (1) answer various types of questions, such as comprehension questions, (2) interpret pictures, graphs or diagrams, (3) conduct brief surveys of other students, or the wider community, (4) experiment, (5) construct posters, videos, or use other styles of production/presentation, (6) give traditional essay-style written answers.

Students have a choice of topics, within syllabus guidelines. For example, if they are required to do a city study, they may choose one of several cities — in conventional classes the teacher usually selects one city that the whole class studies. The units are usually written at two levels, so that students can choose either an easier or a more challenging option. Students with considerable learning difficulties have different units to select from (often incorporating work prepared by the New Zealand Correspondence School).

Social Skills

In addition to the academic programme, *Achieve* has a social skills programme. Once a week one period is devoted to Forum time, in which discussions and role play cover issues relevant to the age group, such as assertiveness, peer pressure, coping with put-downs. Because the programme has students of wide abilities, from learning disabled to gifted, and the students are of varying ages (from 12 to 16), they are grouped in **tutor** groups.

These tutor groups are partly for administrative ease — tutor teachers are responsible for the overall academic development of students, although subject teachers monitor individual curriculum progress. However, considerable pastoral care and social development occurs within them and it is here that central values, such as acceptance, tolerance of others, and skills of collaborative learning, develop.

Tutor conferences became an essential means of monitoring progress. Ideally there are fortnightly interviews. Naturally, some students need more frequent monitoring. During these sessions they show the tutor the work they have managed to do in each curriculum area. The *Achieve* tutors encourage the students to extend themselves wherever they show particular strengths; at the same time they encourage them to keep up their achievement in other areas. The tutor teacher also talks with the student about work and study habits, any learning or social difficulty and specific needs. Tutors often help pupils set individual goals, such as: deadlines for particular assignments; improvements in behaviour; or help them in setting up mini research projects. Rapport and good relationships between teacher and pupil are essential.

A voluntary buddy system operates to provide students who have either behavioural or learning difficulties with a good role model. Buddies undertake to work with each other for at least one period a week. The mixing of abilities is a highly valued component of *Achieve*.

Although independent learning forms the basis of *Achieve*, elements of co-operative learning are also promoted. Each term a cross-curriculum day provides students with an opportunity to work with others on a variety of group tasks. Within the traditional subjects, opportunities are periodically provided for tutorial sessions, workshops, discussions and group tasks, such as drama productions. Co-operative learning was not part of the first year *Achieve* programme but was recognised as important by the second year, and is now integrated into its philosophy and practice.

Our research

Action research was our methodology. This meant putting aside any research prejudice favouring an aloof approach and instead working in a partnership with the teachers, asking questions and seeking to solve problems which were relevant to them. It also meant giving frequent feedback from interviews and surveys so that teachers could choose how to deal with issues as they arose.

We interviewed all *Achieve* teachers each term and interviewed 45 students three times. Fifteen of the students were of high ability, 15 of average ability, and 15 had 'special needs'. Within these groups, gender and age were carefully balanced.

In addition, we surveyed the students twice, administered various standardized tests, and devised an *Achieve Study Skills and Learning Strategies Inventory*. Observations were recorded one half day per week for 18 months in the regular classroom setting, assemblies, on school camps, trips, cross-curricular days, parent-teacher meetings, open days, and staff meetings.

Finally, parents' views were also sought. They were surveyed twice, as well as informally interviewed at parent-teacher evenings and Open Days. Data was triangulated using the parent, teacher and student sources.

Results and Conclusions

Students

The vast majority of students enjoyed the programme. Choice was what they valued most about it. This choice was in:

units of work,
rooms to work in,
students to work with,
teachers to approach,
length of time to spend on any topic,
the pace of learning.

As time went on, students became more confident in organizing themselves and working independently, but less tolerant of larger group activities (including ordinary school classes) and teacher-directed sessions. They became concerned about other students' behaviour interfering with their work, such as constant chatter and 'mucking around'.

Nevertheless, students enjoyed mixing with students of different abilities. The more able students valued their increasing social skills, while the less able appreciated help with their academic work. As familiarity with other students grew, tolerance for differences developed and there was less labelling of other students, for example, 'munchies' had been a favourite term of abuse, but almost disappeared.

The students say that because they have greater control over their learning, they enjoy school more and the majority felt they were making better progress than the previous year.

Teachers

Teachers grew in their confidence and belief in the programme. They were pleased when they gained greater understanding of *Achieve's* objectives; when the workload reduced (initially unit writing and organizational demands were extremely high); and when they had developed appropriate teaching and facilitating skills. Teachers had to adapt to an individual rather than a class focus, and that demanded skilled questioning, monitoring and individual tutoring. They valued this individual interaction and students' increasing responsibility for their own learning.

However, they experienced some frustrations and difficulties. For example, the students' behaviour was less than desirable at times; often the students just did not do enough work; there was the pressure of too few resources; and to monitor individual students required different habits. To illustrate this last point, students often chose to work in a different room from the one expected — for instance, some students did their maths in the science laboratory — and were hard to find when you wanted to see them. Working with a team of teachers accentuated different philosophies and standards, but this had benefits as well as difficulties.

Frustrating for some teachers was the reduction of group work and discussion times. However, group work and discussion increased later when optional tutorial sessions were offered and the offer taken up. The amount of time teachers had to spend overall did increase. This was because there were more frequent meetings (*Achieve* meetings added on to other school commitments) and there was the load of unit preparation. However, teachers enjoyed dealing with a variety of curricula, not just one specialist subject, and catering for individual learning abilities. They appreciated the closer support of other teachers and getting to know students more as individuals. Seeing their students, each working at his or her own level and developing organizational skills, was very satisfying to the teachers.

Professional development was more informal than formal. Teachers learned considerably from each other just chatting and from ideas shared at staff meetings. They attended few courses or teacher-only-days, due to limited funding.

Parents

Parents are an essential element in the programme. They agreed to attend parent evenings each term and sign their children's planning grids each week. At the outset they were well informed by the school about *Achieve*. The research sought their views as well.

Parents were highly satisfied with the balance between academic and non-academic work, students' enjoyment of the programme, teacher assistance with individual work, and the mixing of different abilities. They valued the development of self-motivation and independence in self-directed study. The flexibility of the programme, along with the teachers' positive attitudes were appreciated. However, there was ambivalent opinion amongst the parents concerning discipline in *Achieve*. They felt that teachers should be more strict about work habits. They also were unsure about the degree of feedback the planning grids gave on school progress. At times parents felt concern about the apparent lack of structure and guidelines and an uncertainty about standards.

Nevertheless, parents anticipated similar outcomes from *Achieve* as teachers did. They hoped students would develop socially, would have more confidence and self-esteem, gain academic potential, learn more, improve their study and work skills, and enjoy learning.

Data

The quantitative data from tests and observations revealed mixed trends. There was a wide range of progress among the students. When we looked for the reasons we were able to distinguish contributing factors in the children's own natures, and factors that impinged from outside. The critical factors that were part of the children's own characteristics included:

(1) their ability to organize themselves,
(2) their perseverance,
(3) their perception of being in control of their own learning,
(4) their ability to focus on the task at hand,
(5) their style of learning,
(6) their tolerance for activities of other students around them,
(7) their confidence to ask for help when needed.

The factors that came from outside included:

(1) the school climate,
(2) the school's success at communication,
(3) individual contract learning,
(4) co-operative learning,
(5) styles of teaching,
(6) the mixing of abilities,
(7) teacher perceptions,
(8) administration and organisation.

Communication was found to be critical at many levels: principal-teacher; teacher-teacher; teacher-student; student-student; teacher-parent; *Achieve*-main school; and public relations with the wider educational and local community. The better informed people were, and the more often consulted, the more smoothly the programme ran. However, such communication is demanding of teachers' time, energy and skills.

Students' reactions to self-directed learning were varied. They had to make considerable adjustments to distractions; they had to learn to work alongside others; they had to work out and interpret for themselves, or with peers, the written instructions. There were occasions of frustration when they could not find teachers or had to wait for them, just as the same problem had bothered teachers. Setting your own pace of learning is a challenge. At many times they were unsure of how much work was expected of them. Few students had any idea of what was a reasonable amount of work to accomplish in a given period or week and teachers frequently had higher expectations of students than they had of themselves. The students also faced uncertainty about standards of work.

All these problems came as part of the adjustment to a new style of learning. However, on the positive side, students were able to ask questions on precisely what they needed to know — they were not held back by other students asking questions on material they already understood. More able students were able to work ahead, while slower learners were able to spend time consolidating their learning.

Teachers found catering for a wide range of abilities a challenge. They continually roved, answered questions, attended to requests, checked on centres of greatest noise, asked students questions about their work, and checked for understanding. Teachers also had to contend with a great variety of subjects and topics being studied in one room. Initially some teachers found this differentiation of learning difficult to cope with, particularly if they felt they ought to know all the answers. Where teachers took more of a problem-solving or inquiry approach, they were not daunted by the variety but thrived on it. Experience of the programme and interaction with the students, increased teachers skills, especially in handling varying ability levels, and there was the bonus of sharing ideas with other teachers.

Comments

Noteworthy in the organisation of *Achieve* was the role of the principal and the *Achieve* co-ordinator. The principal was pivotal to the establishment and implementation; she was the driving force behind the programme, the source of ideas, philosophy clarification and reinforcement, the provider of additional resources, morale booster and public relations officer, and a key motivator of the teachers. Her relationship with the team of *Achieve* teachers and the co-ordinator were critical for the establishment and continuation of *Achieve*.

Achieve is a complex programme with a myriad of interrelated components. Not all factors have been discussed in depth here. We hope that we have given you some understanding of the organisation of *Achieve*, the main benefits and limitations, and the culture it engenders amongst the students. As with any innovative and developing programme, modifications are still under way. Nonetheless, in the words of students:

***Achieve* is choice!**

Notes

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A fuller account of the research and *Achieve* can be found in
Poskitt, J., McAlpine, D. and Ryba, K. (1992) *Report on the Achieve Project*, Palmerston North: ERDC Massey University.

Overseas programmes with similarities to *Achieve* can be read in
Rohrs, H. (1992) 'The Daltonized School: A Model of Learner Managed Learning'. In *New Era in Education*. Vol. 73, No. 2, pp. 42-48.

and
Baird, J. and Mitchell, I. (1986) *Improving the Quality of Teaching and Learning: An Australian Case Study — The Peel Project*, Melbourne: Monash University.

The PEEL Project is also mentioned in Item No.6, 'Questionable Assumptions' by Richard White, in this *set*.

Co-operative Learning research has also been the subject of *set* items, for example
Johnson, D. and Johnson, R. 'Co-operative Learning, Computer Assisted' in *set* No.1, 1987, Item 14.

and
Johnson, D. and Johnson, R. Co-operative Learning Strategies for Mainstreaming/Integration' in *set* No.1, 1988, Item 4.

and can be studied more fully in
Johnson, D. and Johnson, R. (1975) *Learning Together and Alone: Cooperation, Competition and Individualisation*, New Jersey: Prentice-Hall.

In surveying the students the following standardised tests were used
Reid, N. *et al.*, (1975 and subsequent) *Progressive Achievement Tests*, Wellington: NZCER

Boersma, F. and Chapman, J. (1992) *Perception of Ability Scale for Students* Manual, Los Angeles, USA: Western Psychological Services.

Action research is explained in
Elliott, J. (1991) *Action Research for Educational Change*, U.K.: Open University Press.

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'I've found my memory'

RECIPROCAL TEACHING IN A PRIMARY SCHOOL

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Introduction

WHEN TEN-YEAR-OLD JULIA was asked why she found it difficult to remember text she had just read, she used to answer glumly, 'It's because I lose my memory'. Nowadays her approach to reading is greatly improved and her comprehension skills match her decoding ability. Ben, a 9-year-old boy remarked, 'Before, I was dumb at reading, now I am good', while 10-year-old Steven added 'I can read faster and understand what I have just read'. These happier comments were made following an experimental trial of Reciprocal Teaching in their classes. Reciprocal teaching is a collaborative, instructional procedure which teaches and encourages children to think as they read and therefore 'find their memory'.

Reciprocal teaching is a small-group, interactive dialogue which centres around four cognitive strategies known to enhance reading comprehension: **questioning, summarizing, clarifying, predicting.**

An example

Teacher: Would you like to be the teacher today Kevin and ask a question about the information we have just read? Kevin?

Kevin: Has everyone finished? Okay, When was the ship launched? Ben?

Ben: In 1909.

Kevin: Great, that's right.

Kevin: Okay, my summary now is that 'The Star of Canada' was launched in 1909.

Julia: Was that in New Zealand?

Kevin: No, it was launched in Canada.

Teacher: That's very good thinking Kevin, but we can also include what the ship was carrying in our summary.

Ben: I know a better summary, 'The Star of Canada' which was launched in 1909 was built to carry frozen meat overseas.

Teacher: Nice one Ben, you made a very good summary.

Kevin: Now, for my prediction. Um, I'm not sure, can anyone else help?

Ben: I can, what happens to the boat?

Alan: Can I be the teacher next?

Teacher: Sure thing, Okay we know the story so far is about a ship carrying frozen meat. So let's read on
(Silent reading of a paragraph)

Alan: My question is how much, I mean, how many weeks did the men work hard to get all the cargo out? Julia?

Teacher: That's a good question but is it the most important one Alan?

Steven: I know, what happened to the ship? Alan?

Alan: Right, she was caught in a storm near Gisborne.

Julia: And then she broke up.

Steven: Okay that's right. Well my summary is um, 'The Star of Canada' was caught in a storm near Gisborne and broke up.

Teacher: Do we need to clarify anything here?

Becky: I'm not too sure what broke up means.

Ben: Well it's when the ship goes into um pieces isn't it?

Julia: Yeah, it has hit the rocks, keeled over and bits start to break off, it's a gonner.

Teacher: Excellent job everyone, I like the way you're all helping each other. Are there any predictions?

Becky: I know, the next part will be about what happens to all the people and stuff on board.

Teacher: Well, lets read on and see if Becky is right... (Silent reading).

Description

As the example shows, active participation is the cornerstone of reciprocal teaching. When I first introduced reciprocal teaching to my students we discussed why they sometimes had difficulty in understanding what they had just read. I then briefly discussed the four skills which would help them to remember text. They are:

Questioning. After reading a short passage the dialogue leader, or 'teacher', asks the rest of the group a 'teacher-like' question. Later, they come to identify main idea information, learn to disregard trivia and self-question to check their understanding of what they have just read.

Summarizing. Learning this strategy also helps children to locate main-ideas by finding a topic sentence. If there isn't one, they make one up. Leaving out redundant information by using a covering word for long lists is another skill, e.g. 'bears, pandas, and elephants' can become 'animals'. Eventually the task is extended to include integrating information across paragraphs.

Clarifying. This skill helps the children to recognize when they aren't comprehending. They learn to restore meaning actively by re-reading, reading ahead or asking for assistance. Not all passages require clarification.

Predicting. Asking about what might happen next helps the student and teacher to link old and new information and shows the teacher the child's current level of comprehending. Using available sources such as titles, pictures and headings, helps the child to focus on this skill. Sometimes too few source clues preclude a prediction.

At first I had to do most of the leg-work, but with practice and increased confidence, the students became effective dialogue leaders, and the onus of control was shifted from me to the students, allowing them to become responsible for their own learning. Through structured dialogue I could adjust my support or 'scaffold' and function more in the role of a 'coach', responding with feedback, encouragement, and reinforcement. Lessening the support for each child is a gradual process; each student has to become adept in applying the strategies to what they have just read. Some reach this goal more quickly than others, but the group situation allows for this.

Research foundations

Developed by Palincsar and Brown in 1984, reciprocal teaching is now a firmly established and an effective procedure to combat comprehension deficits. A series of researchers have evaluated this instructional strategy both in original and modified forms across a range of primary and secondary school students with comprehension difficulties. Accurate comprehension involves the use of self-questioning and self-monitoring activities. These create an awareness of one's own learning — a process now termed 'metacognition'. Teaching low comprehenders the four metacognitive skills of self-questioning, summarizing, clarifying, and predicting improves their comprehension performance. This happens as they (1) learn to establish conscious control of their thinking processes through learning about the purpose of reading, (2) actively monitor their own reading, (3) apply effective strategies to facilitate reading comprehension.

The studies mentioned above and detailed at the end of the item were all successful in bringing about significant gains in reading comprehension. However, they all employed additional staff and resources to carry out the reciprocal teaching programme. We wanted to look at how reciprocal teaching could be carried out by the regular class teacher within the usual instructional reading period. Therefore, in an ordinary urban primary school, children from two parallel classes of Std. 3 (Year 4) and Std. 4 (Year 5) were taught using reciprocal teaching and we researchers took note.

The Study

Using the Progressive Achievement Test (PAT) of Reading Comprehension and the Burt Word Reading Test, we found out how competent at comprehension and decoding the 72 children were. Eighteen students were selected and divided evenly into two experimental groups and one control group.

The Two Experimental Groups. We selected children with delays of between six months and two years on their comprehension scores. The children were also ranged in decoding levels; some were decoding at an age-appropriate level, others were decoding at as much as three years below their age norms.

The Control Group. Six students served as a group-reading, attention-only, comparison. They used the same reading material as the reciprocal teaching groups, for an identical period of time, but were not instructed in the metacognitive skills. They were at average to above average levels at selection.

The Procedure

The reciprocal teaching sessions occurred daily for part of the second term of the school year and were included in the regular reading programme for both classes. While the teachers conducted the sessions for 20 to 25 minutes, the remainder of the 36 pupils in each class continued by themselves with reading tasks they had been given.

Texts. Non-fiction articles from New Zealand School Journals were used for both the reciprocal teaching and daily comprehension assessment. Passages from the journals varied in length, but each article was read to the end before a new text was begun. The daily assessment passages were from 250 to 300 words long, and for each passage a ten-item test was devised with 4 text-explicit, 4 text-implicit and 2 script-implicit questions.

Daily Format. Each day the teachers started with a discussion, everyone trying to predict the content from the title. Following silent reading each child then took a turn at (1) devising a 'teacher-like question', (2) thinking of a short summary, (3) predicting what would happen next in the passage, and if necessary, (4) seeking clarification of some point. During the early sessions the teachers modelled the strategies extensively, but with practice the students became more adept, so the teachers were able to reduce their 'scaffold' or support and act more as a coach in providing corrective feedback, reinforcement and praise. The teacher emphasised that the procedure was a general one and could be applied as a strategy to all texts. After each 20 to 25 minute session, the children collected and completed the test and recorded their previous day's marks in their personal folders.

Transfer of Knowledge. Much of the earlier research on reciprocal teaching has failed to ask if children pick up the general strategy and apply it to other reading that they do. We made sure that we tested this. Without warning we, from time to time, asked the children to read a similar passage of fiction silently, then straight away gave them a 10-question comprehension test.

Teachability. To examine if the reciprocal teaching strategies are easy for teachers to add to their skills (without the theoretical base), a second year teacher was introduced to the reciprocal teaching procedures and she tried them out, teaching a different group of children of the same age.

Results

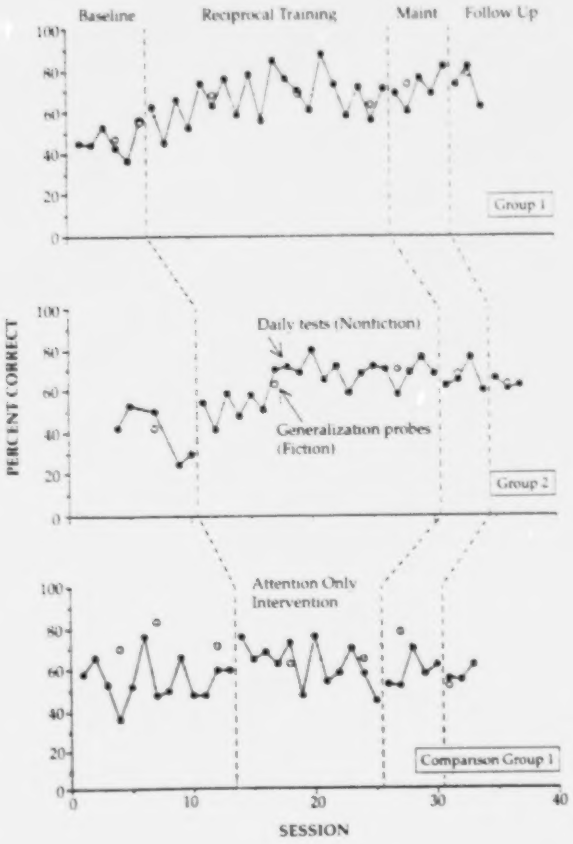
Encouragingly, the results show significant gains for all children in the experimental groups compared to the control group; see Figure 1.

Inspection of the graphs show that when reciprocal teaching was introduced, an associated increase in daily comprehension scores occurred. Group One increased from an average of 46.2 percent during baseline to 66.8 percent during the intervention phase, while Group Two improved from 40.0 percent to 63.5 percent. Both are statistically significant increases. The control group showed no equivalent shifts in either trend or level. Furthermore, Group One and Two maintained their gains on completion of the treatment; when tested 8 weeks later during the follow-up phase, Group One scored an average of 72 percent and Group Two scored 63 percent, demonstrating a long lasting effect for reciprocal teaching.

The important tests for generalization (transfer of learning) are also presented in Figure 1; it is clear that the students were applying their new skills to other reading.

Figure 1

Group mean percent accuracy on the daily assessment tests for Experimental Groups One and Two and the Comparison Group Three



PAT Comprehension Results

The students completed Form B of the comprehension test in February and the parallel Form A of the PAT in August. The results, presented in Table 1, again show significant increases for the Experimental Groups, gains of an average of more than one age equivalent year. Once again, no such increases were noted for the comparison group.

Table 1

Mean PAT Comprehension Scores (and Standard Deviations) Before and After Reciprocal Teaching for Experimental Groups 1 and 2 and the Control Group

Group	PAT Comprehension Before	PAT Comprehension After
Group 1	18.0 (5.2)	24.7 (5.0)
Group 2	16.2 (5.8)	23.7 (5.2)
Control group	25.3 (3.9)	26.2 (4.2)

Burt Word Reading Test

Table 2 presents an average gain of 8.6 months for Group One and 11.5 months for Group Two over the period May to August. The control group has a gain of 3.8 months on average, about what you would normally expect.

Table 2

Scores on the Burt Word Reading Test

	Pre-Intervention		Post-Intervention	
Subject	Age	Pre	Post	Gain in months
Group 1				
	(May)	(May)	(Aug)	
1	9.10	8.5	9.9	16
2	10.10	7.5	8.4	11
3	9.10	8.0	8.4	4
4	10.6	11.8	12.0	4
5	10.6	9.2	9.6	4
6	10.10	10.3	11.4	13
				average 8.7
Group 2				
1	10.6	10.8	11.6	10
2	10.10	8.9	9.7	10
3	9.8	8.8	10.2	18
4	10.7	10.4	11.4	12
5	10.9	11.3	11.7	4
6	10.8	9.3	10.6	15
				average 11.5
Control Group				
1	9.4	10.7	11.8	8
2	10.1	10.3	10.6	3
3	9.1	8.5	9.5	12
4	10.6	12.1	12.5	4
5	10.6	11.8	11.4	-4
6	9.11	12.0	12.0	0
				average 3.8

Metacognitive Strategies

In order to have a look at how well the reciprocal teaching strategies were being used, and who was using them most — teacher or pupils — we examined 24 audio-tapes recorded in Class One. Table 3 shows when the teacher and each student employed the skills of questioning, summarizing, predicting and clarifying.

The teacher used the strategies most in both the baseline and the first half of the experimental time. However, during the second half there is a marked increase in the average use by the students of metacognitive strategies. This allowed the teacher to reduce her verbal scaffold and cede her control and domination, allowing the students to co-operatively control their interactions.

Table 3

Mean Use of Reciprocal Teaching Strategies per Session in Baseline, Intervention, Maintenance, and Follow Up Phases for Experimental Group 1 Teacher and Students

Subject/Phase	Questioning	Summarizing	Predicting	Clarifying
Teacher				
Baseline	0.8	0.2	1.2	0.2
1st half Treatment	3.1	2.4	0.8	0.8
2nd half Treatment	1.3	0.5	0.0	0.3
Student 1				
Baseline	0.0	0.0	0.0	0.0
1st half Treatment	1.3	0.3	0.0	0.0
2nd half Treatment	1.6	1.3	0.5	0.3
Student 2				
Baseline	0.0	0.0	0.0	0.0
1st half Treatment	1.4	0.5	0.3	0.0
2nd half Treatment	1.6	1.0	0.2	1.5

Student 3				
Baseline	0.0	0.0	0.0	0.0
1st half Treatment	0.8	0.5	0.5	0.1
2nd half Treatment	1.3	0.6	0.3	0.0
Student 4				
Baseline	0.0	0.0	0.0	0.0
1st half Treatment	1.2	1.0	0.4	0.1
2nd half Treatment	1.6	2.0	0.3	0.3
Student 5				
Baseline	0.0	0.0	0.0	0.0
1st half Treatment	0.9	0.3	0.3	0.0
2nd half Treatment	1.1	1.9	0.4	0.5
Student 6				
Baseline	0.0	0.0	0.0	0.0
1st half Treatment	1.0	1.1	0.3	0.0
2nd half Treatment	0.9	0.7	0.7	0.0

Discussion

The results are exciting: they provide clear evidence of the positive effect of direct, overt and explicit training in the four metacognitive strategies. Such training produces long lasting improvements in students' reading comprehension, not only for the sort of reading in the experiment, but in general.

Furthermore, the implications of this study for classroom practice are clear: any teacher is able to undertake reciprocal teaching sessions without any extra resources or staffing assistance. It was good to be able to take previous research finding further to arrive at this point.

Whilst we set out to see if using reciprocal teaching was possible in everyday classrooms, an added bonus was the increases in reading decoding scores, most noticeable with the initial lowest scorers. In addition to the evident improvements in reading comprehension, there were changes in attitude towards reading. The children showed this in questionnaire answers, teachers mentioned it anecdotally and parents reported that their children were reading more at home and, most importantly, enjoying it! On the student's part it may be that they do not feel threatened, they are encouraged to participate at whatever level they can, and there is the excitement of taking part in a new type of lesson. However, don't expect results to occur overnight, bad habits are always the hardest to break.

Through reciprocal teaching, the children become more aware of reading being a goal-directed activity rather than something we do between play and lunch – they learn to learn, a skill known as meta-learning and one that is necessary in reading and understanding complex material; one that they will face increasingly in secondary school.

Reciprocal teaching embodies much of the best of teaching practices, in that it is both structured and interactive and designed to enhance both collaborative and self-regulated learning. Child and teacher work together to make things happen so the child never feels out of depth and the context encourages a supportive learning process where modelling, practice and feedback lead to the gradual transfer of responsibility for performing tasks from an expert to a novice.

Reciprocal teaching does not have to be confined to reading comprehension. Successful studies have shown that the principles of the procedure can be applied across the curriculum, and with 'at-risk' pre-schoolers, deaf children, and learning impaired secondary school children to help students become better listeners.

Reciprocal teaching does not require the development of any new skills, as the four strategies employed are skills that teachers use regularly. The best results were found when reciprocal teaching was implemented for 20 consecutive days, i.e., 5 school weeks. However, lasting effects have been noted for lesser times and when used for less than the optimum 5 days a week. Daily testing is not necessary, but it does provide a valuable gauge of learning and may act as a catalyst for some children. To ensure the children continue to use these strategies once the reciprocal teaching programme is completed, it is a good idea to review these skills regularly. Then, once they've 'found their memory', they keep it!

Notes

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DR DENNIS MOORE is a Senior Lecturer in the Education Department at Auckland University, Private Bag, Auckland, New Zealand.

A manual with more detailed step-by-step help with implementing reciprocal teaching in the classroom is in press. It will include photographs and the daily tests used in the experiment. For more information and copies, when available, please write to Dr Dennis Moore at the Education Department, University of Auckland, Private Bag, Auckland, New Zealand.

The concept of scaffolding is from

Wood, D., Bruner, J.S. and Ross, G. (1976) The role of tutoring in problem solving, *Journal of Child Psychology and Psychiatry*, Vol. 17, pp. 87-100.

An introduction to reciprocal teaching by its developers is

Palincsar, A.S. and Brown, A.L. (1984) Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities, *Cognition and Instruction*, Vol. 1, pp. 117-175.

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and

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and

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and

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Tests used in this research include

Gilmore, A., Croft, A. and Reid, N. (1981) *Burt Word Reading Test, New Zealand Revision*. Wellington: NZCER.

and

Reid, N.A. and Elley, W.B. (1969) *Progressive Achievement Test of Reading Comprehension*. Wellington: NZCER.

The daily 10-item tests were devised using guidance from

Pearson, P.D. and Johnson, D.D. (1978) *Teaching reading comprehension*, New York: Rinehart and Winston.

Table 2

The students completed Form B of the comprehension test in February and the parallel Form A of the PAT in August. The results are presented in Table 1. A single classification analysis of variance confirmed that the comparison group PAT scores were significantly higher than those of both the experimental groups before intervention. An analysis of co-variance performed on the post-test scores treating pre-test as a co-variate, and subsequent pair-wise comparisons of the adjusted means yielded a significant difference between the comparison group and both experimental groups, thereby confirming the beneficial effect of the Reciprocal Teaching programme with both the experimental groups.

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item 9

set
number two 1993

How Lack of Confidence in Spelling Affects Children's Written Expression

David Moseley
University of Newcastle upon Tyne

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Nicola Belsham

THERE ARE SIGNIFICANT NUMBERS OF CHILDREN who are competent with oral language, but who are handicapped in their written expression by poor spelling. Poor spelling does not mean low verbal ability: in a survey of 1254 eight- to nine-year-olds in 16 inner-city schools I found that 39 percent of the poorest spellers scored in the average range or above on a vocabulary test that used pictures instead of words. In another study I found that competence in spelling the most commonly used words was almost completely unrelated to vocabulary level. These experiments show that the idea that poor spellers have poor vocabularies is quite wrong.

In some cases, at secondary school, when demands for written work increase, children's oral language competence comes to a standstill too. If the teacher does not expect much of poor spellers and they do not expect much of themselves they certainly produce written work of poor quality. Recent British policy documents have suggested that the first goal for poor spellers should be the mastery of high frequency words. This simply reinforces the expectation of low performance. The last words poor spellers are motivated to learn are high frequency words that they get wrong all the time. Making spelling mistakes in words like 'again', 'coming', 'friend', 'knew', 'their', 'too' and 'where', is not a sign of low intelligence, although it is often taken as such by those who make these errors. Unfortunately the poor spellers themselves, as well as misinformed politicians, take it to be true.

When poor spellers take examinations the problems multiply. Examiners are forewarned about special individual cases and that in those cases poor spelling should not adversely affect their overall impressions – just as they are forewarned about blind or cerebral palsied children taking exams. However, there are many children who spell badly who do not have the benefit of a special report on their difficulties. Those researchers who study and develop tests always warn that examiners vary in the extent to which, both consciously and unconsciously, their marking is influenced by spelling. With many awards now made for work not done under 'exam conditions' but through continuous assessment, unfair advantage can be obtained by those children who have access to electronic spelling checkers or whose parents correct spellings for them. Some of those who do not have such advantages may in fact be doubly disadvantaged if, in their attempts to reduce the incidence of spelling errors, they try to restrict themselves to words that they can spell.

If it could be shown that the quality of children's writing could be improved by eliminating the problems and anxiety which are often associated with spelling, many children currently thought of as linguistically impoverished would respond to higher expectations. New evidence should make teachers more cautious than ever in judging a poor speller's language abilities from samples of written work.

If writers are over-concerned about spelling, then the words they select (and the quality of their expression) are likely to be affected. They will use more words that are spelt in a regular way and words that are short and of high frequency; they will repeat words and phrases; the overall quality of their writing will be reduced because they are paying too much attention at the single-word level.

It can now be demonstrated that these effects do in fact occur on a substantial scale. The evidence has been obtained by using a text-scanning computer program called 'Watchword' to analyse samples of children's writing. For example, I have scanned twenty representative samples published by the British Assessment of Performance Unit (APU) in a publication, *How Well Can 15-Year-Olds Write?*

Do poor spellers use more regularly-spelt words?

One of the 20 APU scripts scanned was left out from this analysis, since it was evidently produced by a pupil of Asian origin with very little English; one word in three was misspelt and it was evident that this pupil had virtually no awareness of spelling conventions, regular or otherwise. When the five poorest spellers were compared with the five best spellers, a significant difference was found. The poor spellers used 35 percent more regularly-spelt words than the good spellers. Children who were not just poor spellers but had been diagnosed as dyslexic as well, used 47 percent more regularly-spelt words than controls.

The answer is yes. Poor spellers pick easy-to-spell words.

Do poor spellers use more short words than good spellers?

A significant correlation was found between word length and spelling error rate. This shows that poor spellers tend to avoid the use of long words. The dyslexic pupils used more words of 1 and 2 letters, and significantly fewer words of 7 or more letters than the controls.

The answer is yes. Poor spellers pick short words.

Do poor spellers use more 'core vocabulary' high frequency words than good spellers?

This question was addressed by seeing what proportions of the words they used were from a list of the 500 words most used in school readers and textbooks. The poor spellers did indeed tend to limit themselves to a core vocabulary. The good spellers ventured beyond it. The dyslexics and the 'ordinary' poor spellers had virtually identical scores on this measure; in neither case is it plausible to argue that a restricted written vocabulary represents an equally limited oral vocabulary.

The answer is yes. Poor spellers use a lot of high-frequency words.

Do poor spellers avoid certain words because they are hard to spell?

Stronger evidence was sought to support the argument that poor spellers avoid the use of certain words because they are hard to spell rather than because they do not understand or do not want to use them. If they do, their range of written expression must be severely limited. Do they work hard at communicating their ideas without using certain basic words? If they do, their work will appear of poor quality but will be the result of much clever vocabulary substitution and syntactical juggling, setting an impossible task for anyone assessing their real ability with language.

The New Zealand Council for Educational Research has carried out a study of children's writing, taking a nationally representative sample in the age-range 7 to 13. No direct help with spelling was given, but the children did have access to spelling lists and dictionaries. From the 1250 scripts a list of the 300 most frequently misspelled words was compiled and a list of the most commonly used 300 words. A third list was then abstracted of the words common to both these lists – giving 51 commonly misspelled, commonly used words.

I then took these 51 words and individually matched them with 51 words equal in length and in frequency of occurrence in children's writing. I discovered that competent spellers used equal proportions of words from both lists of 51, and that poor spellers used a smaller proportion of the 51 hard-to-spell words than of the 51 easier-to-spell words.

Looked at in another way (by taking the five best spellers as the norm, since their choice of words is the least likely to have been influenced by spelling difficulty), half of the 15-year-olds showed a strong avoidance of the 51 hard-to-spell words. They were almost four times more likely to use a matched easy-to-spell word than one that is hard to spell.

This finding is of considerable importance. It indicates that the fear of making spelling mistakes interferes with written expression on a large scale, and certainly for 75 percent of average British 15-year-olds.

Do poor spellers find ways of repeating the same words in order to minimise error?

English, unlike many other languages, finds repetition of words and phrases unpleasing. In a short piece of writing there can be little reason for repetition unless it is for deliberate effect. The average length of the 20 scripts from *How Well Can 15-Year-Olds Write?* was 239 words, with a range from 52 to 499 words. It might be thought that there are enough easy-to-spell words for it to be unnecessary for poor spellers to have to resort repeating 'safe' words. Nevertheless, some children I have talked to say that they use this tactic. So I checked. There were necessary adjustments to make because simple counting would not do. More repetition will be found in longer pieces so an adjustment is necessary – poor spellers tend to write less than good spellers.

The answer is yes. Poor spellers do repeat words they know how to spell and avoid words they do not.

Putting the results together

When all the findings are added together they must delight the spelling reformers and George Bernard Shaw's Professor Higgins, not to mention poor spellers like the editor of ***set***. A poor speller struggles to find words that he or she can manage, and where possible opts for short words that have one letter representing one sound, avoiding if possible words that are outside a basic store of a few hundred easy and familiar items, and repeating easy words if necessary. Even after this tortuous process one error is likely to occur in every sentence.

The Scottish Committee on Language Arts in the Primary School examined thousands of pieces of children's writing ten years ago. They were not impressed by the quality, finding a 'remarkable similarity... the chronological recording of journeys and events and the listing of things consumed' and unimaginative cloning of 'Draculas, Star Trek or ghosts'. They blamed teachers for this 'sterile uniformity', saying that teachers 'trivialise the daily experience of children' by emphasising correctness while making little attempt to expand or enrich content. Yet, in suggesting how an account of a class party could be improved by using words like 'excited', 'colourful', 'tasty', 'fizzy', 'shining', 'nervous', and 'whirling', the committee failed to note that the girl in question would probably have doubled her already high rate of spelling errors.

Should assessment of overall quality be influenced by spelling mistakes?

One explanation of the lack of confidence many children experience as writers is that they feel incompetent when comparing themselves with adult standards of spelling in the form of proof-read printed text. How far teachers make matters worse by negative marking practices is an open question. We have seen how it very often happens that, in the attempt to avoid spelling errors, children limit their written language both in quantity and in quality. This seems to happen not only to dyslexics but to poor spellers generally. Therefore poor spellers will tend to receive poorer overall marks. In the Assessment of Performance Unit (APU) sample this was found to be the case, with a strong correlation between spelling error rate and overall grading. In fact **in more than half the cases, poor marks could be put down to poor spelling alone**. No other single objective measure I tried (vocabulary range, total number of words, word and sentence length) accounted for as much variance.

This leads us to two important questions. How much qualitative improvement would result if pupils could be persuaded to write without worrying about the number of spelling mistakes? (We would have to find a way of helping them stop worrying about having lots of words to correct or to write out if they made lots of errors.) Secondly, does present examination policy and practice have the effect of preventing those who cannot spell well from coping with curricular demands and from obtaining qualifications?

Times have changed since the days when copper-plate handwriting and impeccable spelling were the sine qua non for most white-collar occupations. Many first-rate computer programmers (who have to be very careful about the accuracy of detail) are poor spellers and it is possible to reach high levels in mathematics, science and technology without writing a lot of prose or even being widely-read. Spelling checkers are part of every good word-processing package and are nearly universal in offices; dictionaries with improved methods of access for poor spellers are available in schools and in homes and I have been the author of one of these, the *Aurally Coded English Spelling Dictionary*.

When children work for qualifications which involve producing examples of their work it is impossible to control the extent to which they have received help with spelling. It would be much fairer if all examiners decided, and candidates knew, that poor spelling would be ignored in certain written examinations, or in parts of them. If this proposal seems too radical, a safeguard might be added to the 'spelling-doesn't-count' rule in the form of a separate section in English language exams in which spelling, and the ability to identify and correct one's own errors, is formally assessed.

Both the 'back to basics' and the 'creative spelling' arguments suffer from the weakness that there are no proven methods for raising standards of spelling and of written expression. It is not at all clear that talking about the differences between speech and writing and emphasising the need for Standard English (a current directive in Britain) is going to inspire young writers to give of their best. There are, however, some interesting ideas that have not yet been fully exploited, such as 'writing without teachers', 'philosophy for children', the use of computerised expert systems and active learning approaches to the study of spelling.

Notes

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This item is adapted from a longer and more technical article which first appeared in *Educational Psychology in Practice*, April, 1989.

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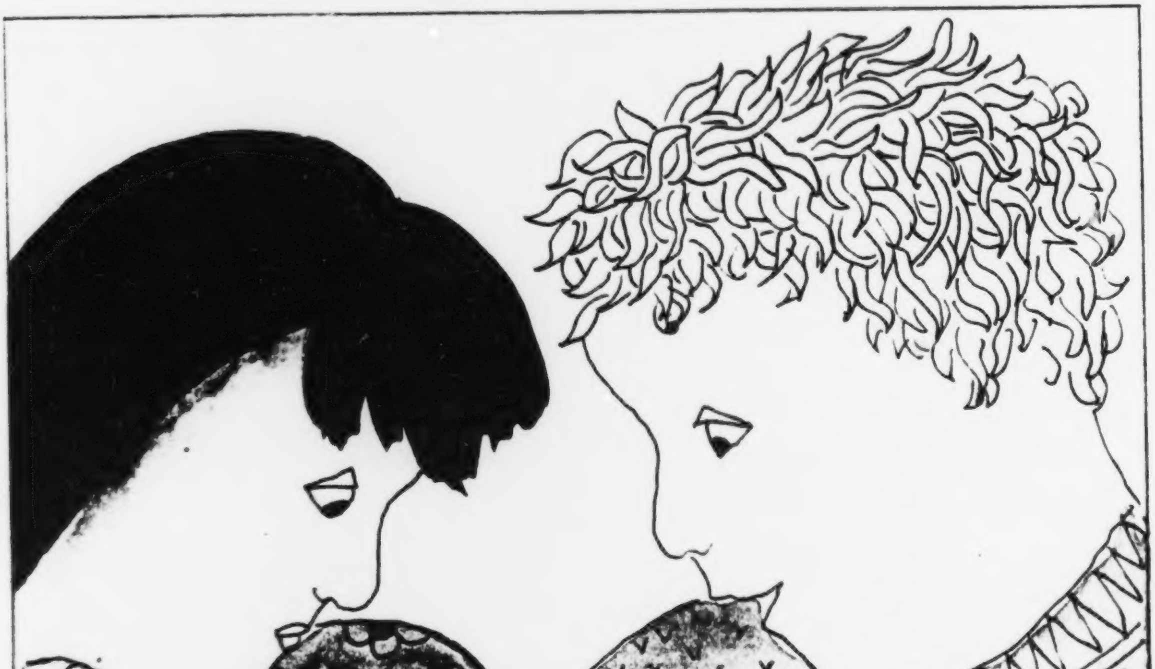
item 10

set
number two 1993

THE (RELATIVELY) CONSTANT CONSONANT

Roy Bevan
University of Newcastle upon Tyne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Shona McLean

The English have no respect for their language, and will not teach their children to speak it. They cannot spell because they have nothing to spell it with but an old foreign alphabet of which only the consonants – and not all of them – have any agreed speech value.

George Bernard Shaw (Preface to *Pygmalion*, 1912)

The following conventions are used in this article.

- The 'sounds' of English are represented like this: /æ/ is the first sound in the word apple. There is some help with these in the Appendix.
- Letters of the alphabet are represented like this: <A> is the first letter in the word apple.
- Words in the examples are shown underlined like this: apple. A single word that is used to illustrate a point like this is often called a 'citation' form to make clear that it is an idealized word used in isolation. In continuous speech, the way words are spoken often varies considerably from the citation form. For example, the word to in citation form is pronounced /tu:/ but in continuous speech (e.g., to town) it will be /tə/.

Introduction

WHEN SHAW COMPLAINED ABOUT 'an old foreign alphabet of which only the consonants – and not all of them – have any agreed speech value' he had writers in mind. But the less than perfect sound-symbol system creates problems for readers as well. Of more importance here, Shaw drew attention to the fact that written consonants are relatively reliable indicators of what is said, although the same cannot be said for the written vowels. This is the theme of this *set* item.

Despite Shaw's accurate observations, those who think phonics is the only way to teach reading seem to say that the teaching and learning of reading in English is little more than knowing an 'agreed speech value' for each letter of the alphabet (as well as a few letter combinations such as **sh** and **ch**). The belief is that the learners, who can 'sound out' the letters, will be able to use this knowledge to decode (and construct) written words: '**d - o - g** says dog, **c - a - t** says cat, **sh - i - p** says ship.' What could be easier?

If it really is as easy as this, it would be an exceptional teacher who ignored it and we would wonder why anyone questioned its value. If learning to read is simply a matter of knowing a few 'agreed speech values' for letters of the alphabet, why do so many children and adults find learning to read such a problem? Why do books on initial reading line shelf upon shelf in any education library? Why are there reading associations and so much heated debate about how to approach the teaching of reading in the classroom? Why are there specialist journals and magazines devoted entirely to research and discussions about how to teach reading?

As all teachers of reading know, phonic approaches are very far from simple. One reason for this is that the rules of phonics are not like mathematical rules: in phonetics 2 + 2 often equals something other than 4. There are so many irregularities in the phonic 'rules' of English that various techniques have been used to postpone them, the most famous example being the use of the Initial Teaching Alphabet, devised by James Pitman in 1959.

Teachers recognise that phonic approaches are problematic and when they are using phonetics the chances are that they focus more on the *written consonants* than the *written vowels* because they 'know' that consonants are more reliable and because it is consonants (rather than the vowels) which 'frame' words. If you can read what follows, even though all written vowels have been removed, you will have a good idea what I mean:

> H-s f-v--r-t- st-ry w-s *Th- C-nst-nt T-n S-ld--r* b- H-ns Chr-st--n -nd-rs-n. Tw-lv- t-n s-ld--rs h-d b--n m-d- fr-m -n -ld sp--n. Th-y w-r- -x-ctly th- s-m- -xc-pt f-r Th- C-nst-nt T-n s-ld--r. H- w-s d-ff-r-nt fr-m th- r-st b-c--s- h- h-d -nly -n- l-g.

Even though much of the message has been removed, readers can still make sense of it. Are there any practical implications from this for the teaching of reading?

1. Theory and practice

The use of phonics is not at all straightforward even if we accept the theory that continuous speech can be satisfactorily segmented into separate sounds – for example, the 24 consonant sounds and 22 vowel sounds which are identified in many popular theories.

1. There is a bewildering variety of sound-spelling 'correspondences' with hundreds of rules and many exceptions. Researchers studied 1-syllable words and 2-syllable words found in books for 6- to 9-year-olds. They identified at least 69 spelling units, including groups of letters such as *ch, th, bb, tt, ea, oy* ('grapheme units'). Leaving aside about 10 percent of the words (because they were *exceptions*), the researchers found **211** different spelling-sound correspondences and **166** rules for the remaining 5431 words.

   So the rules of phonics are very very complex. Worse than this, they cannot be relied on because there is no way of predicting when a particular correspondence applies. What is the use of a complex set of rules if there is no reliable guide for when a particular rule should be employed?
2. Letter by letter analysis of words is a very slow procedure which relies heavily on memory of phonetic rules and disregards the reading process of fluent readers.
3. Beginning readers may become locked into a phonic strategy and think of reading only as a logical and serial procedure when, in fact, it is neither. For example, the sound value of the letter <O> in the following words cannot be determined until each word has already been 'decoded' as a whole: moan /əu/, mob /ɒ/, moist /ɔɪ/, molest /ə/ money /ʌ/, moon /u:/, more /ɔ:/.
4. Phonics may give undue emphasis to the elements of words and to 'accuracy' – at the expense of 'fluency'.
5. The sound values for the written symbols, *especially* those which represent spoken vowels, vary from dialect to dialect: for example, the national accents, Welsh, Irish, Scottish, American, Australian and New Zealand all have different (and systematic) vowel systems as do local accents, Geordie, Cockney, and Liverpudlian. This raises a fundamental question about the sounds which are represented by the spelling units of English – whose sounds? For example is the letter <A> in the word dance pronounced /æ/ or /ɑ:/ and is the first <Y> in Sydney pronounced /ɪ/ or / i:/?

When thinking about vowels and consonants it is necessary to distinguish between the (about) 46 *sounds* of English which are identified as *consonants* and *vowels* (see the Appendix for a list) and the 26 *letters of the alphabet* which are also referred to as *consonants* and *vowels*. The difficulties of using phonics might be reduced, and even overcome, if teachers focused on the sound values of *written* *consonants* (and neglected the values of *written vowels*) when using phonics to help learners to read more effectively.

There are two reasons:

1. written consonants are relatively stable compared with written vowels;
2. written consonants carry far more information for working out the meaning of an unknown word than vowels.

If this is so, there are good grounds for teachers to concentrate on the value of written consonants and to ignore values for written vowels when teaching 'sound-symbol' correspondences (using phonics) in teaching reading:

1. as a strategy to help beginners;
2. as a strategy for helping false beginners (that is older children and adults who cannot read fluently).

To illustrate the complexity of sound and spelling correspondences and the relative stability of the symbols for consonants, we need consider only a few letters of the alphabet, say the first four.

2. Written consonants are more stable than vowels

In a written language in which each letter of the alphabet represents one sound and each sound of the language is represented by one symbol, we can say there is perfect sound and spelling correspondence, and the relationship is perfectly stable.

In English, the sound-spelling system is a very complex one: Dewey in 1971 calculated that in English there are about 13.7 spellings for every sound but only 3.5 sounds for each letter. In this sense, the writing system of English is highly unstable. However, as Bernard Shaw pointed out so provocatively, the symbols that represent spoken consonants, have a greater stability, or consistency, than the symbols used to represent spoken vowels.

3. Consonants have relative two-way stability

3.1 Symbols to sounds

Written consonants are relatively stable (in single words or citation forms). Although there are complexities, the 'sound' possibilities for any given *written consonant* or combination of consonants (spelling units) are relatively few. For example, consider the first three alphabetic (written) consonants <B>, <C> and <D>. The letter <B> can represent the sound /b/ in bat, and occasionally zero /ø/ (or silent 'b') in numb. The letter <C> represents either the sound /k/ in cat or /s/ in ceiling – and we could say there is a 'silent c' /ø/ in words like scene and muscle. The letter <D> represents only one sound /d/ and it is thus stable in value. These symbol to sound possibilities are illustrated in Figure 1.

Figure 1

Symbols to sounds

<B>
- /b/ in BAT
- /ø/ in NUMB

<C>
- /k/ in CAT
- /s/ in CELL
- /ø/ in SCENE

<D>
- /d/ in DOG

3.2 Sounds to symbols

When we consider ways in which a particular *consonant sound* is spelt, again, the analysis is relatively straightforward. The sound /b/ is realized by the letter <B> and sometimes <BB> – and arguably by <P> in spin. The sound /k/ is realized by <K>, <C>, <CK>, and sometimes <QU>. The sound /d/ is represented by <D>, <DD>, or <ED> (though <ED> as a past tense marker is pronounced in three ways: loved /d/, hated /ɪd/, walked /t/). The symbols used to spell the sounds /b/, /k/ and /d/ are illustrated in Figure 2.

Figure 2

Sounds to Symbols

/b/ - <B> in BED
- <BB> in RUBBER

/k/ - <K> in KING
- <C> in CAT
- <CK> in LUCK
- <QU> in QUAY

/d/ - <D> in DOG
- <DD> in RUDDER
- <ED> in SAVED

4. Vowels have relative two-way instability

Each of the *written* vowels (<A>, <E>, <I>, <O>, <U> and <Y>), both singly and in many combinations, can represent over 20 *spoken* vowel sounds (see the Appendix) and there is a complex network of possibilities because each *vowel sound* can be represented by many different letters or combination of letters and each *vowel letter* can represent many different vowel sounds (see Figure 6 for an illustration of a small part of that network, or web of sounds).

For convenience, and by convention, all the illustrations of sound and spelling correspondences in this paper are based on what is usually known as *Received Pronunciation* (RP) or *the Queen's English*. However, only a small proportion of children speak English in this way. Wherever they are, most children do not speak a 'prestige' or 'educated' variety of English when they begin to learn to read: when they speak English they use a vowel system which does not match the analysis below. Nevertheless, though analyses of different accents vary in detail from dialect to dialect, the overall complexity of the analysis (whatever the accent used by the learner) remains.

To illustrate the complexity of the vowel system consider the letter <A> in Figures 3 and 4 (spelling to sound) and Figure 5 (sound to spelling).

4.1 The letter <A> and the sound it represents

Figure 3

Sounds realized by letter <A>

<A> - /ə/ and /æ/ in A CAT
- /eɪ/ in PAPER
- /iː/ in QUAY
- /ɑː/ in FAR
- /eə/ in BARE
- /ɪ/ in VILLAGE
- /e/ in MANY
- /ɒ/ in WAS

Figure 4

The sounds realised by the letter <A> in combination with other letters

<EA> - /iː/ in LEAF
- /e/ in DEAD
- /ɑː/ in HEART
- /ɪə/ in NEAR
- /eə/ in BEAR

<AI> - /æ/ in PLAIT
- /eɪ/ in WAIST
- /aɪ/ in AISLE
- /eə/ in FAIR

<AR> - /ɑː/ in PART
- /eə/ in CARE

<AL> - /ɑː/ in CALM

<AU> - /ɑː/ in AUNT
- /ɒ/ in BECAUSE
- /ɔː/ in FAULT

<AW> - /ɔː/ in SAW

<OA> - /ɔː/ in BOARD
- /əu/ in ROAD

<AY> - /iː/ in QUAY
- /eɪ/ in DAY

4.2 The sounds /eɪ/ and the symbols used to represent it

Figure 5

Symbols used to realize the sound /eɪ/

the letter <A> is pronounced /eɪ/ in the alphabet

the letter <A> is pronounced /eɪ/ in MAKE
the letters <AI> are pronounced /eɪ/ in RAIN
the letters <AY> are pronounced /eɪ/ in PAY
the letters <EI> are pronounced /eɪ/ in EIGHT
the letters <EY> are pronounced /eɪ/ in THEY
the letters <EA> are pronounced /eɪ/ in GREAT

4.3 A complex sound symbol network

Simply by using the sounds realised by the letter <A> (see Figure 3) and some of the sounds realised by the letter <E>

> */ə/ in MOTHER; /iː/ in PETER; /ɪ/ in WOMEN;*
> */e/ in EGG; /ɜː/ in HER; /ø/ in SPARSE*

it can be seen that the web of relationships between spoken vowels and their written representation is very complicated indeed. Figure 6 is an illustration of such sound-spelling (sound-symbol) relationships. It is a fragment of a much larger map or complex web of sounds.

5. Consonants have a high information value

The written system for representing spoken consonants is more stable than the written system for representing the spoken vowels of English. To add to the consonant examples already given, the sound /p/ is regularly spelt with a <P> or <PP>; /t/ with <T> or <TT>; and /g/ with <G> or <GG>. For this reason, *written consonants* have a far higher information value than *written vowels.* This is reflected in speech for when we listen to spoken English the consonants carry a great deal of the message. For example, when listening to speakers with different accents we have little difficulty in understanding them even though the vowel system – but not the consonant system – that they use may vary greatly from accent to accent.

In a similar way, when we read English the information value of the written consonants is especially high. This is best illustrated with an example. Figure 7 is part of a reading passage (with a title to help the reader) in which the written consonants have been omitted. About 60 percent of the message has been removed. The message cannot easily be reconstructed by a reader. Further, without the surrounding consonants it is impossible to predict the value of the vowels with any degree of certainty. It is as though the written vowels are switched on by the consonants.

Figure 7

Reading passage – vowels only

READING
--ea-i-- i- a -o---e- -a--. A- -e--, a --
o--e--e o- --o-i-- -a- o--y -ui-e --e
--ea-e-. --o-i-- -a- -e -e-y -o--u-i--
-o- -ea-- -o -ea- a-- --e '-o-i-' o-
--o-i-- -a- -e -i--ea-i-- -e-a--e i- -
a-
-ea- -o -ea-i-- ---a-e-ie --i-- -a- -oo
-u-- a--e--io- -o -e--e-- a-- -o--- a-
--e e--e--e o- -ea-i-- a-- --ue-y.

(about 60 percent of the message has been omitted)

Figure 8 is part of the same reading passage but the symbols used to represent the vowel sounds have been omitted, leaving the consonant symbols intact. About 40 percent of the message has been omitted. Despite this, fluent readers are able to reconstruct the message quite easily by guessing what comes next, using their understanding of the topic (world knowledge), and their knowledge of English syntax, idiom and vocabulary.

Figure 6

A complex web of sounds

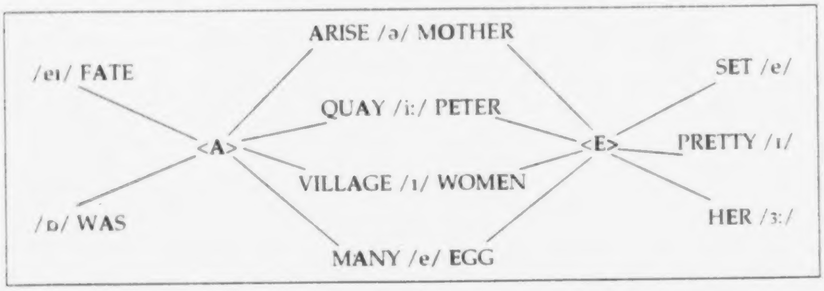

Figure 8

Reading passage consonants only

READING
R--d--ng -s - c-mpl-x t-sk. -t b-est, -
kn-wl-dg- -f ph-n-cs c-n -nly g--d- th-
r--d-r. Ph-n-cs c-n b- v-ry c-nf-s-ng f-r
th-s- r--d-rs wh- -r- b-g-nn-ng t- l--rn
t- r--d -nd th- 'l-g-c' -f ph-n-cs m-y
b- m-sl--d-ng b-c--s- -t c-n l--d t-
r--d-ng str-t-g--s wh-ch p-y t-- m-ch
-tt-nt--n t- l-tt-rs -nd w-rds -t th-
-xp-ns- -f m--n-ng -nd fl--ncy.

(about 40 percent of the message has been omitted)

The complete text is shown in Figure 9.

Figure 9

Complete text

READING
Reading is a complex task. At best, a knowledge of phonics can only guide the reader. Phonics can be very confusing for those readers who are beginning to learn to read and the 'logic' of phonics may be misleading because it can lead to reading strategies which pay too much attention to letters and words at the expense of meaning and fluency.

6. Some implications for the teaching of reading

The vowel system is an especially complex network of values; on the other hand, the consonant system seems relatively straightforward. For this reason, and because consonants have a high information value, phonic work can profitably focus on consonant values in the early stages. After all, there are alphabetic writing systems which do not have symbols for vowels and there are others where the inclusion of symbols for the vowel sounds is optional – for example, the earliest known alphabet (North Semitic) c. 1700 BC consisted of 22 consonant letters and no symbols for the intervening vowel sounds; the consonantal alphabets of Arabic and Hebrew mark vowels, optionally, with diacritics.

Here are some practical suggestions for the classroom. All aim to encourage beginning readers to use consonants as a guide for reconstructing the written message, to 'go for meaning' and to develop reading fluency.

The teacher could use a well-known story, topic or an event experienced by the reader(s), as the basis of a reading game (e.g., 'Find the hidden message'). The activities can be used for individual or group work. The material can be presented on a chalkboard, an overhead projector, in worksheets, or on a computer. It is assumed that the learners have done phonic work which focuses on the values for consonants only (**b** for box, **c** for cat, **d** for dog, **ch** is for chopper, **sh** is for ship etc).

6.1 Omit all vowels from the text (see Figure 10)

The example below is the beginning of a story. The only modification is all vowels have been removed.

Figure 10

All vowels omitted from a text

T-M TH- T-RR-BL- C-T
L-ng, l-ng -g- th-r- w-s - w-ck-d -nd
b---t-f-l w-tch. Sh- l-v-d -n - l-ttl-
h--s- -n th- m-ddl- -f - f-r-st. Sh- h-d
n- fr--nds t- k--p h-r c-mp-n- b-t sh-
h-d - bl-ck c-t wh-ch sh- c-ll-d T-m.
Th-r- w-s n- -th-r c-t l-k- T-m f-r h-
w-s v-r- f-t -nd -gl-. H-s --rs w-r- t-rn
-nd h- c--ld n-t p-rr. H-s t--l w-s b-nt
-nd h-s cl-ws w-r- l-ng. H- w-s -
t-rr-bl- c-t.

6.2 Omit vowels but retain them in the grammatical words such as articles, pronouns, prepositions (see Figure 11)

In this example, the modification is less severe: all the grammatical words (e.g., the, a, and, in, she) are left intact.

Figure 11

All vowels omitted – grammatical words intact

T-M THE T-RR-BL- C-T
L-ng, l-ng -g- there was a w-ck-d -nd
b---t-f-l w-tch. She l-v-d in a l-ttl-
h--s- in the m-ddl- of a f-r-st. She had
no fr--nds t- k--p her c-mp-n- but she
had a bl-ck c-t which she c-ll-d T-m.
There was no other c-t l-k- T-m for he
was v-r- f-t and -gl-. His --rs were t-rn
and he c--ld not p-rr. H-s t--l was b-nt
and his cl-ws were l-ng. He was a
t-rr-ble c-t.

6.3 Keep whole text intact but highlight consonants using colour or bold print (see Figure 12)

The final possibility is perhaps the most attractive because the only modification to the text which is required is to highlight the consonants using colour or bold print. This application is thus most easily exploited when children have access to computers with colour monitors or someone has access to printing in colour.

Figure 12

Text intact but consonants highlighted

TOM THE TERRIBLE CAT
Long, long ago **there was** a **wicked and beautiful witch** . . .

6.4 Applications in teaching and research

Teachers may wish to explore the relative merits of each of the three techniques illustrated above. Learners can reconstruct texts (like those shown in Figures 10 and 11) and read their solutions aloud to the teacher, or to one another in pairs or in small groups. The challenge of reconstructing texts can also be used as a whole class activity.

The technique (which I have used with a teenager to develop fluency and to break down an over-reliance on phonic analysis and synthesis) might also be investigated in small-scale research in the classroom. I would be very happy to hear from anybody who is planning or conducting an inquiry of this kind.

Notes

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A longer and more detailed version of this paper can be found in Vol.27, No.3, November 1993 of *Reading*, a publication of the International Reading Association (UK).

The 24 consonant sounds and 22 vowel sounds usually identified, with International Phonetic Alphabet symbols are detailed in the Appendix.

The research on 1-syllable and 2-syllable words in books for 6- to 9-year-olds is found in

> Berdiansky, B., Cronnell, B. and Koehler, J. (1969) *Spelling-Sound Relationships and Primary Form-Class Description for Speech-Comprehension Vocabularies of 6-9 Year Olds*, Southwest Regional Laboratory for Educational Research and Development, Technical Report No. 15.

The unreliability of phonics because there is no way of predicting correspondences between spelling and sound is discussed in

> Smith, F. (1988) *Understanding Reading*, 4th ed., Hillsdale, N.J.: Lawrence Erlbaum Associates.

The problems of phonics giving undue emphasis to the elements of words and leading to guessing from grammatical context can be read about in several places, including ***set***. For example, see:

> Nicholson, Tom, (1986) Good Readers Don't Guess. ***set*** No.2, 1986, Item 13 and Item 14.

and

> Rummelhart, D. (1977) Towards an interactive model of reading. In S. Dornic (Ed.) *Attention and Performance VI*, Hillsdale, N.J.: Lawrence Erlbaum Associates.

and

> Smith, F. (1985) *Reading*, 2nd ed., Cambridge: University Press.

The calculations of 13.7 spellings for each sound and 3.5 sounds per letter comes from:

> Dewey, G. (1971) *English spelling: roadblock to reading*, New York: Columbia University Press.

A fascinating book on language in general which has excellent sections on reading and spelling including George Bernard Shaw's alphabet and a description of North Semitic (mentioned in this item) is:

> Crystal, D. (1987) *The Cambridge Encyclopaedia of Language*, Cambridge: University Press.

Appendix

The following table is from a list in the *Longman Dictionary of Contemporary English*. It indicates by use of examples (key words) the values of the symbols used to represent sounds (phonemes).

CONSONANTS		VOWELS	
symbol	**keyword**	**symbol**	**keyboard**
p	pen	iː	sheep
b	back	ɪ	ship
t	tea	e	bed
d	day	æ	bad
k	key	ɑː	calm
g	gay	ɒ	pot
tʃ	cheer	ɔː	caught
d	jump	ʊ	put
f	few	uː	boot
v	view	ʌ	cut
θ	thing	ɜː	bird
ð	then	ə	cupboard
s	soon	eɪ	make
z	zero	əʊ	note
ʃ	fishing	ɑɪ	bite
ʒ	pleasure	ɑʊ	now
h	hot	ɔɪ	boy
m	sum	ɪə	here
n	sun	eə	there
ŋ	sung	ʊə	poor
l	led		
r	red		
j	yet		
w	wet		

Note: the five tripthongs (all ending in /ə/) in player, lower, tire, tower and employer are not included above.

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item 11

set
number two 1993

LITERACY

In Classrooms, Curriculums, Assessments and Politics

A review of the work of

Peter Freebody

Griffith University, Queensland

Introduction

AUSTRALIAN EDUCATION IS, in 1993, frantically busy with literacy. Research into literacy is well funded and literacy programmes have sprung up at every level of schooling and beyond. This 'literacy' is not, however, what was studied under that name in the past. Nor is it the literacy United Nations' statistics deal with. It is the literacy defined in the Commonwealth Government White Paper *Australian Literacy and Language Policy*, 1990 - 'The Dawkins Report.'

New Zealand does not have the same busy-ness. The Employers' Federation members continue to say New Zealanders are not well educated and right-wing pressure groups keep repeating that prosperity will arrive only if education levels are higher. The emphasis has been on new qualifications. But international comparisons (mainly the IEA studies) get good publicity and they keep saying that New Zealand children are the best (or second best) readers and comprehenders in the world. New Zealanders consider Australians can't be *very* far behind. So why all the fuss?

In this review article an attempt is made to show

(1) what researchers have discovered goes on in class when literacy is being inculcated,
(2) how literacy could be properly assessed,
(3) how there is a mis-match between what the current political vision asks for and what real literacy is.

Part 1. Classroom literacy teaching

(A) Practice

A classroom where literacy is a major aim is, these days, one where the programme produces individual readers and writers who can be assessed for that one set of skills, a set of skills about which there is no doubt.

Unfortunately for the people who see literacy as a clear, undoubted, set of skills, there are very few studies of how teachers accomplish this in the first months of schooling, and those few studies do not paint a picture of simple teaching, easy learning and straightforward assessing. However, I am able to give an example of some work by myself and Dwyer in 1992. Recording classes at work gave us transcripts for examination. Here is an extract from a reading lesson about eight weeks into the first year of formal schooling, the average being about five years.

In this class there is one child, Zac, who arrived at school fully literate. In literacy lessons Zac took to cruising, helping other children, and responding to the teacher's complaints or queries about other children's efforts. It is clear that part of the teacher's work is to inculcate what counts as getting a task done successfully.

EXAMPLE 1

241 teacher	Well, how would you find out where it said *slobby*?
242 Jane	You'd look at *slobby*.
243 teacher	Well, how would you do that?
244 student	Oh
245 student	It's easy.
246 Jane	Find... find the... find the person, like Zac.
247 teacher	Yes, that's one way, you could go and ask Zac, because he knows how to write *slobby*. But if Zac were busy, what else could you do?
248 Jane	Look on the board.
249 teacher	mm, where would we look... Christine? No, just stay there and tell me darling. Hmm? where?
250 Christine	Next to the monster.

***

254 teacher	But how do you know that says *slobby?*
255 Christine	Because it has /s/.
256 teacher	So does this one.
257 Christine	I know that//.
258 teacher	//so does this one.
259 student	'Cause, 'cause they know 'cause it's got a 'b', two b's over there.
260 Zac	And a 'o'.
261 teacher	Oh, that's a good idea, Zac, yes you can look for some other sounds that you can hear. *Slo - obby* Good boy.

There are a number of points to make about this excerpt, even from a brief examination.

First, the student, Jane, hears the first question (241) with 'how' as a request to locate a word as if she were already a reader ('how would you find out where it says *slobby?*).

Second, she next hears 'how' (243) as 'how actually would you accomplish the task', to which she indicates that she would recruit Zac. Zac's hypothetical unavailability leads Jane to revert to 'looking' (248), and the teacher selects another student to rebuild the exchange.

Third, the teacher responds only when she receives an answer based on the alphabetic features of the word (255-6). Zac, out troubleshooting, has by this time entered the fray and clinches the exchange by mentioning a distinctive letter in the target word, for which he is rewarded.

So, to master literacy (what the teacher wants) Jane must get the hang of special school talk ('find out where' means in class 'locate, by yourself, a written word from internal clues only.') Secondary teachers will hear echoes of this special sort of talk - which they themselves use - when they ask for 'genuine responses' to literature.

The use of special 'school talk' points out that what we have here are not some sort of basic, primeval, absolutely necessary, steps in learning but examples of a traditional way of teaching. In this case the *tradition* is *contemporary western-style schooling*.

Example 2 is from a session following the chorus reading, with the teacher, of a book. The class is about halfway through the second year of schooling, with an average age of about six and a half years.

EXAMPLE 2

291 teacher If you had a chance to be one of the things in our story, which... or someone in the story, which would you like to be?
292 student hh!
293 teacher Carl?
294 Carl The cricket. I mean the big weta.
295 teacher The big weta.
296 student Oh so would I.
297 teacher Why would you like to be the big weta?
298 Carl 'Cause he comes last.
299 teacher He comes last, but what's what happens to him that's so uh so good do you think? -
300 Carl 'Cause he, he gets to stay in the bed.
301 teacher He gets to stay in the bed. Yes.

This exchange illustrates that some forms of answers count as complete answers and some do not. The answer called for by 297 appears to be a description of the student's own self-reported consciousness. However, it is unacceptable. The teacher reforms the question in 299. The teacher has a pre-determined form of answer: one that calls for a plot-specific statement.

From the two transcripts it appears that, to accomplish a reading lesson special traditional or *ceremonial* ways of answering need to be understood. This is certainly what the Russian theorist Vygotsky thought. John Heap, drawing on his ideas says the concept that is being taught is not a fact or skill but

> 'whatever the teacher permits to pass, uninterrupted and apparently unchallenged as an adequate display of reading skill, counts, procedurally as adequate, until further notice.'

(B) Curriculum

The curriculum guideline documents, textbooks, worksheets, and media resources used in school serve also to make particular versions of domestic and public experience into the ones that must be accepted. In the first year or so of schooling, classroom reading materials recast the everyday domestic experience of children. For instance, 'boyness' and 'girlness' are portrayed in Example 3.

EXAMPLE 3

> "We have to jump this," says Peter.
> "Come after me. I know how to do it. Come after me, but keep out of the water."
> Jane says, "Mummy said that we must keep out of the water."
> "I know she said so," says Peter, "but we are not going in the water. I know how to do this."
> Peter jumps again. "You can do it, Jane," he says.
> Then Jane jumps. She says, "Yes, I can do it. Look at me, Peter. I can do it."

A particular version of what is proper for girls and boys to do is used in this exchange, the most startling being that the girl acts *in loco parentis* - judging actions from their parents' point of view. So readers have to go along with this particular 'myth' - that girls act like parents - to make sense of the words read.

Such 'mythical' children, so unlike real children, so 'proper' in their behaviour, are common in beginning school books. Their use of expressive words has been summarised as follows:

EXAMPLE 4

i) The term *like* is applied to the case of one person liking another only six percent of the time, it is used by and about parents almost never, and the boy/s-characters are statistically more likely to *like* objects and events, and the girl/s-characters animals.

ii) The term *good* is statistically much more likely to be used by persons to or about one another than is *like*. Further, the statistical patterns of association of use among characters are: mother/s to and about girl/s; father/s to and about boy/s; boy/s to and about events.

iii) The term *laugh* has the following associations: boy/s *laugh* more than girl/s; adult/s *laugh* at boy/s and animals, while girl/s *laugh* at boys and adults. Girl/s rarely *laugh* and are never *laughed at*.

iv) The term *cry* is never applied to adults; girl/s *cry* at being lost, hurt, or losing objects; boy/s almost never.

The adult-characters in these reading materials produce almost no expressive talk or activity and appear to act as surveillance, even when they are not present! More obviously, feelings and judgements are firmly cast along gender and generational lines. Thus an unreal, 'virtual', naturalised, domestic world, for consumption only in the classroom, has been created.

But it is not just the classroom that creates mythical unreal worlds. There are plenty outside. This is seen most clearly at the other end of the schooling process. Example 5 shows a selection from a senior economics text which expects students to see the world as 'free market' economists describe it. Despite being about 'underdeveloped' countries note that the facts are presented (1) without any reference to history, (2) without reference to religion, (3) without any reference to political realities (4) and the people are all free to do as they like (family responsibilities, traditions, laws, police, organised crime and other constraints are not mentioned). The people in this myth are free to join groups and they have the cash and access to birth control procedures and control primary produce prices:

EXAMPLE 5

Less-developed countries (LDCs) tend to be characterised by the following features [a selection from a longer list]:

1. ... most individuals in less-developed countries use their output for their own family ... and exchange little of their production ...
2. Business motivation or entrepreneurship of a productive nature may be lacking.... Capitalistic entrepreneurship may be lacking.
3. Unemployment, labour-intensive methods, underemployment.
4. Life expectancy is low, nutrition and health poor.
5. High growth rates of the population and a distorted age distribution of the population add to poverty. The higher rate of (population) increase in the LDCs may suggest the less frequent use of birth control techniques...
6. ...

Here we have an account which is stripped of all non-economic factors. It makes individuals alone responsible for the problem, the explanations, the blame, and the solutions of poverty.

This myth making is a powerfully political activity. And this leads us to the problem of assessment.

Part 2. Assessment of Literacy

In our first example the teacher not only assessed the usefulness of Jane's answer but also addressed the level of learning. Zac was praised for being at a higher level. At this stage of schooling simple questions will suffice. But when we want to assess, in school, how well a child has learnt the literacy skills needed 'out in the world' the tech-

nique changes. The technique most often used is to invent test items that simulate the outside world. Here is a test item that attempts to get at the sort of comprehension (a literacy skill) a repairman needs.

EXAMPLE 6

A manufacturing company provides its customers with the following instructions for returning appliances for service:

> When returning appliance for servicing, include a note telling as clearly and specifically as possible what is wrong with the appliance.

A repair person for the company receives four appliances with the following notes attached. Circle the letter next to the note which best follows the instructions supplied by the company.

A
> The clock does not run correctly on this clock radio. I tried fixing it, but I couldn't.

B
> My clock radio is not working. It stopped working right after I used it for five days.

C
> The alarm on my clock radio doesn't go off at the time I set. It rings 15-30 minutes later.

D
> The radio is broken. Please repair and return by Priority Post to the address on my slip.

There are a great number of mismatches between this attempted simulation and the 'real world', some more subtle than others. Here are a few:

- Has anybody ever received notes of this kind? Moreover, has anybody, ever, had to nominate one out of a group of notes that 'best follows the instructions'? Do repairers ever rate the relative efficacy of notes except with the usual 'The blxxxy notes are blxxxy useless!'?
- What could happen if the answer given were right or wrong?
- Will the good note writer get better service? Will the repairer who can recognise a good note get promotion?
- Students in tests are left do it (or parts of it) in whatever order they like; this is seldom the case beyond school - most processes require strict attention to order.
- School tests usually have a start and finish time: in the real world a task may be left for days or weeks, until some necessary action or tool becomes available.
- In a school test everything that is needed to get an answer is there. Out in the real world finding the right resources (or rejecting useless bits) may divide the good from the poor worker. In the real world finding Zac may be the best possible answer.

When in school you assess, every question (even if it is answered by ticking a box) is imbedded in a moral order. 'Where is slobby?' involves *learners* doing what *teachers* want. A social order is implicit. And learning is carried out by the ceremonial actions of question (by teacher) and answer (by pupil).

Here is a very current example.

EXAMPLE 7

Draft National Profiles for English

Speaking and listening

LEVEL 1:

- 'explore(s) the possibilities and routines of school'
- 'responds *appropriately* to non-verbal cues'
- '*observes agreed* ground rules in structured large group settings'
- 'asks, accedes to and refuses requests in *appropriate* ways'

***

LEVEL 8:

- 'asserts own point of view or idea with determination and conviction, but without *aggression, condescension or disrespect*'
- 'conveys a sense of genuine, active communication by, for example, *sounding* relaxed and spontaneous during a speech even though the speech was carefully rehearsed'

Again, what are considered inseparable parts of competence are nothing to do with the subject - in this case competence in English includes doing what the school expects (...responds appropriately...), being rational (...without aggression...) and obeying the moral order (...observes agreed ground rules...).

A transparent example of how assessment of literacy is also assessment of moral, rational and conforming-to-the-schools-ideal is in the draft National Profiles for English highest level (Level 8) in which the top student is imagined writing speech notes. Here is a selection:

EXAMPLE 8

When I think about English... I think of opportunities for self expression, personal... and REFLECTION which had made me more aware....

Writing is important in our lives and the English classroom offers us MANY IDEAS for writing in different ways. SELF EXPRESSION is encouraged and we are urged to express ourselves, communicate... with others through WRITING... DISCUSSING DIFFERENT ISSUES. THIS WAY WE DEVELOPE (sic) OUR OWN OPINIONS.

ANOTHER WORLD OR TO ANOTHER VIEW OF THE WORLD... INVITED TO VISIT... EXPERIENCE VICARIOUSLY THROUGH LITERATURE.

Provides the chance for growing adolescents to individually express personal feelings. It is THE subject... creativity of ideas. Imagination is allowed to flourish.

This is an example of what is regarded as the highest level of achievement of oral language a school can manage to impart. Note that it entails the presentation by a speaker of himself or herself as a person whose apparent personal voice is morally, dispositionally, and stylistically full of the imperatives of the English curriculum. The pupil not only claims particular traits ('more aware'), but also sees himself/herself as *developing* within the parameters of the institution. This student publicly says he/she is a 'growing adolescent', who is 'being encouraged' and is 'still discovering'. That is, is made in the image of the school.

Bourdieu, the great theorist of schools as class-bound institutions, would describe what is going on here as the processes by which cultural gifts are systematically mistaken for academic or intellectual gifts.

Part 3. Mismatches in policy and method

The International Literacy Year was a milestone for literacy education in Australia. But this was not only in the ways envisaged by the Commonwealth Department of

Employment, Education and Training: the Department saw it as an occasion to highlight the significance of literacy for employment and the economy in labour markets whose demands are becoming increasingly fluid and complex. And it is true that the Commonwealth's initiatives have stimulated debates on the nature and uses of literacy practices in the school, the community, and the workplace.

However, the current theory of how to bring about prosperity says that human labour is a thing you can buy and sell, just like oranges, insurance, or computer time. Education similarly: literacy is seen as a resource or commodity, or investment, which makes a person worth more (more expensive to hire, but more productive.) This is clear in the opening paragraphs of the Dawkins Report.

EXAMPLE 9

> Australia has embarked on a thorough-going appraisal of its education, vocational training and labour market preparation systems. Schools, TAFE, higher education, industry training and labour market programs have all been subject to major review. Governments have joined with educators, students, parents and business to rethink policies, programs and structures and to work towards national goals that will benefit the nation and better serve the needs of individuals. A heightened concern for quality has emerged - quality in content, in delivery, and in results....
>
> There is a strong and well-demonstrated relationship between low levels of literacy or English language competence and high levels of unemployment and other forms of social disadvantage. To illustrate this, unemployment rates at the time of the 1986 Census varied from 8.6% for those who spoke English only, to 11% for those who used another language but spoke English 'well' or 'very well', to 20% and higher for those who spoke English poorly or not at all. While other factors also are involved, English language proficiency has a vital bearing on the labour market prospects and the general welfare of individual Australians.
>
> We cannot afford the inequities and inefficiencies which such a waste of human resources would entail.

The theory that education is something that improves the worth of people (measured by the wages they can get) involves using 'literacy' in a certain way. It is not the way research scientists have used it. It means something pretty close to 'can read and write in English and do arithmetic, and these skills can be measured simply.'

In the third paragraph of the example, there is an attempt to establish the key relationship: unemployment is related to your first spoken language. Then two conclusions are drawn:

(1) speaking another language *causes* you to be unemployed;
(2) speaking another language is being illiterate.

Somehow the fact that there are 100 or so indigenous languages in Australia and 100 more migrant languages has passed the writers by - to them you are illiterate, and not properly an Australian if you are not fluent in English.

According to this White Paper there is a 'strong and well-demonstrated relationship between low levels of *literacy or English language competence* and high levels of unemployment and other forms of social disadvantage.' (italics added). Similar cultural bias can be found in present day New Zealand.

Is literacy really 'unidimensional'? Perhaps the strange, unreal, mythical world that school is, a world we expect children to deal with before we can teach them to read, write and count, is what hinders our attempts. Perhaps this world of school narrows what we call 'literacy'? We are teachers and work in schools, and therefore to us schools are not unreal nor filled with myths. Perhaps we need to educate those who create the myths of people without history, people without language, people without political awareness. And this may include re-educating ourselves.

Notes

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This ***set*** item follows from a key-note paper presented to the Literacy strand of the joint Australian and New Zealand Associations for Research in Education, Deakin University, Geelong, November 1992. The paper is called *The Politics of Literacy: Classrooms, Curriculums, and Assessments*, and may be obtained from the author.

The Dawkins Report is
Dawkins, J. (1990) *Australian Literacy and Language Policy*. Canberra: Government Printing Press.

The idea that the classroom with a literacy aim has a simple programme easily assessed is discussed in
Baker, C.D. and Freebody, P. (1989) *Children's First School Books. Introductions to the Culture of Literacy*. Oxford: Blackwells.

Good examples of research studying how teachers teach literacy skills in the early years are
Willes, M.J. (1983) *Children into Pupils*. London: Routledge & Kegan Paul.
and
McDonald, G. (1993) Learning to be Intelligent. 'Oh Good. That Was Clever!' in this issue of **set**, Item 2.

Example 1 is from
Freebody, P. and Dwyer, B. (1992) *Inventing Disability in Classroom Talk Routines*. Paper presented to NSW Special Education Annual Conference, Darling Harbour.

Example 2 is from
Baker and Freebody (1989) - see above.

Vygotsky's ideas can be found in
Vygotsky, Lev. S. (1978) *Mind in Society*. Cambridge USA: Harvard University Press.

Heap's comment comes in
Heap, J.L. (1991) A Situated Perspective on What Counts as Reading. In Baker, C.D. and Luke, A. (Eds) *Towards a Critical Sociology of Reading Pedagogy*. Amsterdam: John Benjamin. pp.128-9.

The way curriculum guides, textbooks and workbooks make particular versions of life into the one that must be accepted in school is detailed in
deCastell, S., Luke, A. and Luke, C. (1989) *Language, Authority and Criticism: Readings on the School Textbook*. London: Falmer Press.

Examples 3 and 4 are from
Freebody, P. and Baker, C.D. (1987) The construction and operation of gender in children's first school books. In Pauwels, A. (Ed.) *Women and Language in Australian and New Zealand Society*. Sydney: Australian Professional Publications, pp.80-107.

Example 5 is from
Tisdel, C.A.(1979) *Economics in our Society: Principles and Applications*. Milton, Qld: Jacaranda Press, pp.173-9.

Example 6, and points about it are drawn from
Kirsch, I.S. and Jungblut, A. (1986) *Literacy: Profiles of America's Young Adults*. Princeton: National Assessment of Educational Progress
and, discussed in some detail, from
Heap, J.L. (1989) *Effective Functioning in Daily Life: A Critique of Concepts and Surveys of Functional Literacy*. Paper to the National Reading Conference, Tuscon, Arizona.

Examples 7 and 8 are from
National Profiles for English (Draft) (1992) Melbourne: Curriculum Corporation.

For Bordieu's theories and the idea of cultural gifts being mistaken for academic gifts see
Bordieu, P. (1974) The School as a Conservative Force. In Eggleton, J. (Ed.) *Contemporary Research in the Sociology of Education*. London: Methuen.

Example 9 is from
Dawkins, J. (1990) *Australian Literacy and Language Policy*. Canberra: Government Printing Press.

The idea that literacy is not 'unidimensional' is discussed in
Street, B.V. (1984) *Literacy in Theory and Practice*. Cambridge: Cambridge University Press.

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item 12

set
number two 1993

CONFLICT AND RESOLUTION

During Co-operative Learning with Computers

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Introduction

IN TWO CLASSROOM RESEARCH PROJECTS we used co-operative learning to encourage cognitive progress; this meant using **conflict** and its subsequent **resolution**. Both projects used problem-solving software, *Voyage of Mimi – Ecosystems with Island Survivors.*

Co-operative learning – What is it?

Co-operative learning is much more than assigning children to groups, setting them a task and telling them to work co-operatively.

Interdependence is the first necessity – it is required since it encourages students to have an interest in each other's learning as well as in their own. Therefore co-operative lessons are structured so that the children can learn only by relying on each other and helping each other. This can be managed in four or five different ways: (1) setting mutual goals; (2) dividing up the tasks between group members; (3) dividing materials, resources or information amongst group members; (4) assigning group members different roles; (5) by giving joint rewards.

Success for each individual depends upon the establishment of good working relationships within the group, and these relationships can be fragile. Therefore, children need to know how to use small group skills and these need to be modelled, taught and maintained. The teacher's role, as well as being that of classroom manager and consultant, is to guide the group in seeking their own solutions to what may be unproductive conflicts. An evaluation period in which the teacher helps analyse how the group is functioning is vital to running co-operative programmes. Within this structure, individual accountability is necessary to ensure that every member participates and reaches a level of mastery.

Why Co-operative Learning?

Co-operative learning results in more helping and encouraging among students; members of co-operative groups believe they are liked and supported by the other students; there is a building of trust; optimal use is made of information provided by other students; group members have more confidence in their own ideas; more positive attitudes are held towards the subject and the instructional experience; and in many cases there is higher achievement than with competitive and individualistic learning approaches.

Conflict and Conflict Resolution

The co-operative group provides diverse skills and knowledge, and the opportunity for the clash of ideas. In resolving these disagreements the children have to 'retrieve prior knowledge, seek new information, evaluate their own and other's answers, ideas and opinions, confront their own misunderstandings and lack of knowledge and as a consequence, restructure their own thinking.'

When two people have the same strategies, the probability of conflict is low. However, the chance of cognitive progress is also low. At the other extreme, where one child is more advanced in understanding, that child may entirely dominate the group and fail to explain the criteria for solving the problem. Somewhere between these extreme situations it is necessary for all the children to make the aspects of the problem clear to each other and find a satisfactory solution. The interdependence set up in co-operative learning is an important motivation to seeking solutions. As a bonus, less able students have an influence in the negotiation and final decision.

Effectiveness of the Peer Group

There is good evidence that when children are communicating with their peers (rather than the teacher) they understand each other better, they use a familiar language and as they are working on the same problem, they are able to relate to each other's thinking and problem solving process. They also provide 'precise, relevant and, consequently, effective feedback.'

Computers and Co-operative Learning

Computers and software do not make a classroom into a good learning environment just by being there. Rather, they are a valuable resource if used in an already good learning environment with a variety of different styles of learning.

The value of computer mediated instruction is (1) the motivation it gives (often due to its novelty); (2) the opportunity for experiencing and producing results which would be otherwise impossible; (3) the increase in peer interaction.

Project Summary

Can a computer simulation program help teach about ecosystems within the classroom environment? How would children respond to working in small groups with computers? What sort of conflicts would arise and how would they be resolved? Would there be differences between groups of different sizes and composition? We were looking for answers to these sorts of questions.

Each class used two Apple IIe 128K computers and colour monitors, in a space set aside in the classroom. The software was *Voyage of Mimi, Ecosystems with Island Survivors* published by Bank Street College of Education, New York. You have been shipwrecked on an island and must survive for 12 months until a passing ship can pick you up. First a simple, but accurate ecosystem must be chosen for the island. The ecosystem must comprise 4 land species and 4 pond species. Information about how the food chain works is shown on the screen and more detailed information is available by pressing the '?' key. The battle for survival is divided up into 'months'. Every month each of the three or four castaways had to choose an activity which would help ensure their survival. The food supply level is shown in a simple graph and at the end of each 'month' you are shown graphs of the levels of the species in your ecosystem. To survive you have to ensure that you have adequate food, shelter and firewood. You must take into account the effects of the seasons on the species (e.g., certain plant species will only be available in summer, certain animals hibernate during winter). This information is available on screen through an easily accessed 'help' facility. The survivors must ensure adequate food for the species they chose, and consider the effects of wiping out a species or allowing one to grow unchecked.

Patricia Inder's Class

There were 14 boys and 16 girls in the Std.2/3 (Years 3/4) composite class I worked in. Twenty-eight children were interviewed – all had used a computer before and enjoyed working with them. They also believed that computers helped them to learn. None of the children had any experience with the program, *Voyage of Mimi*.

I put the children into groups of 3, six mixed, two all-boys and two all-girls. Eight out of the ten groups had at least one child the teacher said was of above average ability and in 7 groups a child with social problems was matched with a child the teacher knew to be easy-going and socially accomplished. The interviews were about attitudes to the computers and group work and I also found that no child had any prior knowledge of ecosystems.

I took an introductory session with the class the day before the study began. We discussed what an ecosystem is, investigating the fish tank as a community of living things. This was extended to look at what a food-web is. The children's ideas were written up and put on the wall using a food-web diagram with various parts to fill in. In this session we also discussed what co-operative learning is and agreed upon the following:

1. to listen to what other people say;
2. to wait our turn;

3. to think about others first;
4. to help each other – to use the computer and give ideas;
5. to be nice to other people;
6. to look at the person;
7. no fighting;
8. to talk on the point – explain why, don't shout.

These were the children's suggestions though 'explain why' came from a prompt by me. The introductory session ended with everyone playing at being a cat, a fish, pondweed or the walls of the fishtank. They were thus parts of an ecosystem and we had to invent rules about how to eat the species you needed to survive. We discussed, at the end of the game, what would happen if part of the chain was broken, if, for example, all the fish were eaten by the cat.

Children were assigned to groups and roles sorted out. Each had to be either keyboarder, leader, or screen reader. The roles were discussed and a chart was put up:

Leader

1. Tell group when 30 minutes nearly up.
2. Ensure children in group listen to each other and do not interrupt.
3. Tick list when group member joins in.
   (This job had to be abandoned due to misunderstandings and because in the excitement the children forgot to record.)

Keyboarder

1. Ask children in the group what they think before taking action.

Screen reader

1. Reads what is on the screen.
2. Explains the graph to the group
(at the end of each 'month' and at the end of the game).

Each group had eight 40-minute sessions. This included 30 minutes at the computer and 10 minutes group evaluation. I directed the evaluation and made notes about any difficulties the children were having with either the program or within their group.

The only details the children were told about the program, *Voyage of Mimi*, were that they were shipwrecked on an island and had to find a way to survive for 12 months by selecting 4 land species and 4 pond species to live on their island. They were told that all the information they needed was available on the program and to read the screen to find out how to access it.

Groups were told they would receive a star on the Island Survivor's star chart if they survived and if all members of the group could answer a series of questions about the program, for example, *'How do you find out details about a species?'* or *'When choosing a species what do you need to think about?'*

Results

Understanding of the Concept of Ecosystems.

Prior to the study, none of the children knew what either an ecosystem or a food-web was. After the study, 33 percent of the children had a limited knowledge of what an ecosystem was and 41 percent knew something about food-webs. This low rate is due to the fact that the final questions were not asked in context – they were not asked during the programme – and none of the concepts had been integrated into the full class programme (due to existing commitments.) The value of integrating the topic throughout the curriculum is seen in Ro Todd's project.

Children's Responses to Working with Computers.

All the children, before and after, said they enjoyed working with computers. Most believed computers help you to learn a particular subject, for example, spelling or mathematics. Probing further, before the project, some saw the computer as a 'tool' (I paraphrase their answers) and after the project many mentioned computers as a source of information.

Children's Responses to Group Work.

Prior to the study 89 percent of the children said they enjoyed working in groups. This reduced to 77 percent after the study. Seven of the 10 groups mentioned they had difficulty with someone taking over the keyboard or not listening to each other's suggestions. The interviews supported this. When asked, 81 percent felt their groups had worked well together.

Types of Conflict.

The overall number of conflicts was higher during the study (8.4 incidents per hour) than before (3.2 per hour). Before using the computers most disputes were over actions the group should take; whilst using the computers most conflicts were about the roles within the group.

There were conflicts when a child took over a role from another child; when a child did not do what was expected of them within their role; over sharing materials; over seating arrangements; over selecting species or choosing tasks for the survivors. There were personality clashes and strife when one child acted without reference to other group members.

Resolution of Conflict.

Before the co-operative computer work, children were seen to be solving their conflicts 91 percent of the time. But only 74 percent of the conflicts at the computer got solved without help. The most common way of 'resolving' conflicts during the study was through use of verbal assertion (2.65 incidents per hour). The children did use negotiation and discussion (1.3 per hour) but physical assertion was almost as common (1.25 per hour).

Here is an example of an interaction with the children not listening to each other and one taking over the keyboard out of turn:

Kate:	*I'm meant to be doing it. Let me do it.*
Tania:	*OK what do you want to do?*
Kate:	*I want to push it.*
Tania:	*OK what do you want to do?*
Kate:	*How do you get to here?*

Tania takes over the keyboard at this point.

Differences Between Groups of Different Composition.

The all male group had more conflicts over roles within the group and this was largely to do with the keyboarding role. They also used a higher rate of verbal assertion to resolve their conflicts, for example shouting, *'Don't take over!'*.

The groups who had an unsocial child *unmatched* with a child good at interaction were not very successful in working through the computer simulation. This was also true of groups with no child of above average academic ability. Social difficulty and personality clashes seemed to be the biggest contributor to failing to 'survive'. In the words of one child in the all-girl group, their success was due to the fact that, *'we like each other'*. When there was disagreement in this group they became involved in discussion to correct the misunderstanding. The following interaction from their evaluation session illustrates this:

> There was a disagreement over whether the bears had run out. One of the group cited the graph which indicates the population levels of the species at the end of the 'month' to support her argument. When asked what they needed to think about for the next session, they reported, *'Try not to waste food and put some back. We learnt this from the last game. It took us quite a while to realise.'*

Ro Todd's Class

In my Std.4 (Year 5) class in a lower socio-economic area, there were 10 boys and 10 girls. Some had very little knowledge of computers. Small group work was a typical feature of their classroom and I assigned the children to groups of different sizes and gender composition, all groups of mixed academic ability.

Procedure

I interviewed each child, gaining some knowledge of what they knew of group work and of computers — and how they felt about them. To find out about their understanding of ecosystems I gave each child a slip of paper and asked them to write 'I think an ecosystem is...' and sign their name. The children were encouraged to guess if they did not know. After a few minutes they were given a second option, 'I do not know'. These slips of paper were collected and kept. I then provided a definition of ecosystems and the children brainstormed examples. For one of these, a farm, the discussion was extended: food chains and webs were discussed and the children indulged in several 'what-if' scenarios — what if the rabbit population continued unchecked? What would happen to farm animals, such as the cow? Later that day, there was a class session on objectives and rules for the project. The children were reminded that the project involved ecosystems and group work. The objectives that they agreed upon were:

1. To work well as a group.
2. To understand what ecosystems are and how they work.

The rules that the children agreed upon were:

1. All decisions must be agreed upon by the group.
2. When you say something, say why you think it is a good idea.
3. Listen with real care when other people are talking.
4. Criticise ideas, not people. (I prompted this one.)
5. Before you ask for help outside the group, check if anyone in the group has a solution, or if there is some way you can look up what you need to know.

These objectives and rules were left up on a board. The children were told about the groups and given time to choose a group name. Any group unable to agree upon a name was guided through a process of proposing names that they liked and then selecting one from this list by voting. These names were then written on the board together with access times on the computer.

The children were then split into 2 groups and introduced to the computer software by the class teacher and the researcher. They were given the instructions on a card for the basic commands and procedures needed for the program. The required roles were discussed. The children suggested that a person to record what they were doing and the progress they were making was necessary, and this idea was discussed. They were also prompted to discuss the types of decisions they would be involved in (e.g., how to allocate tasks fairly, what information they would need to select the species for their island) and various ways of resolving these problems.

For the next nine school days, the children worked in their groups at the computer for 30 minutes each day. The computers were available to the children at lunchtime and interval on wet days.

During this time, other class activities were linked to the ecosystem theme. For instance, an art lesson involved the children in drawing a map of their imaginary island, including features such as lakes, shelter and so on and giving it a name. The teacher often made reference to the concepts involved in ecosystems throughout all curriculum areas. Towards the end of the project the class set up an aquarium.

At the end of the study, the children were given a written test on ecosystems and aspects which would show how well they had explored the information available in the program. The children were then re-interviewed about group and computer work.

Results

Understanding of the Concept of Ecosystems.

Before the computer work none of the children had any understanding of ecosystems. Typical answers were:

> *A system to do with science.*
>
> *Something that has an echo.*

At the end of the study, 17 of 19 had an understanding of what an ecosystem is; for example one child answered,

> *A community of living things and their surroundings.*

The test at the end also demonstrated that they had explored the information in the software. For example, they had discovered that a certain pond plant species will be found on land as well as in ponds, and that turtles can be food for humans.

The Children's Responses to Working with Computers.

They were enthusiastic about the whole project, from beginning to end. Their comments showed this:

> *It was good working with friends, because if you got stuck you had someone to ask.*
>
> *Often the boys sit together and the girls sit somewhere else. It's nice to work together.*

Children mentioned the game aspect of the program most when they explained what they liked about using computers and attributed much of the co-operation they had shown to wanting to 'survive' the 12 months the program set as its goal. Hunting and fishing was a popular aspect.

> *I like the hunting and fishing best – I was really good at it.*

Turning off the computer was the part they liked least!

Types of Conflict that Arose.

The types of conflict that arose were (1) management issues, for example, choosing a group name and allocating roles; (2) how to survive in the program task, for example, how much food should be stored, whether to hunt fish or build shelter.

Resolution of Conflict.

The management issues tended to be resolved in the groups of three by majority rule. The groups of four often had to get the teacher to intervene — majority rule was not an option and there always seemed to be a two-by-two division. For example, in choosing a name both the groups of four failed to reach a unanimous decision and appealed to the researcher who asked if they could explain why they each thought their choice was a good one. The response was, *'Cos it's cool'*, countered by, *'Well ours is better.'* The researcher then asked if they could think of another way to decide. One group decided to flip a coin and the other group followed suit.

Both groups of four also had problems in allocating roles. Disputes tended to be resolved in favour of the person seated at the computer. In fact this occurred in all the conflicts I observed. Three of the groups decided the computer would be operated by each person when it was their turn to choose, as one of the castaways, a survival task. Use of the computer at other times was seemingly random. The group of all-boys decided that the role of computer operator would last throughout a session and rotate daily. All groups agreed that the role of recorder would rotate daily and that the recorder would note the species chosen, the name of the castaway responsible for that species, the activities chosen each 'month', the status of the species at the end of the day and the outcome of the game.

Issues relating to how to survive in the program also tended to be resolved by the person seated at the computer. The person at the computer was able to ignore discussions and simply continue to operate the keyboard. In the early stage of the project, very little explanation was given with suggestions or disagreement. As the project progressed more explanations were offered, for example, with the suggestion that food be thrown back was the explanation that it would spoil if they collected too much. However, the decisions made were still dominated by the person operating the keyboard.

Differences Between Groups of Different Size and Composition.

No differences in understanding the concept of ecosystems emerged that could be attributed to the different size or composition of the group, though it would be difficult to generalise with the limited number of groups to compare.

Both groups of four had more problems in choosing group names, had conflict over the allocation and rotation of roles and resorted to outside help. These two groups were also observed making more personal remarks of a negative nature, for example, *'Shut-up, Arthur, just 'cos you're a know-it-all'; 'Der ...oh youse are hopeless'; 'Shut your mouth'*. The two groups of four were the last to survive and both managed to do so only because they were given extra time on the last day of the project.

The group who gave the most explanations when making suggestions was the group of three boys, followed by the group of three girls. The first group to survive was the group of three boys, followed by the group of three girls. These two groups were more successful at solving conflicts and the children showed concern and respect for other group members.

Discussion

From both these exploratory studies, there are several issues that are worthy of note for future projects using computer software used and co-operative learning.

1. *Voyage of Mimi* has American/Canadian species and seasons. It must be remembered that, even when clearly explained, the children may not relate as easily to this, as they would to their own experience.
2. For co-operative learning to occur, interdependence is required. There is no interdependence inherent in this particular program. There was no need for interaction between the children for the group to survive. To survive it required only one child to interact with the computer. We built the co-operation into the grouping, not into the program. Without task interdependence built into the program the person seated at the computer can hold all the power.
3. Even if a software program requires inter-dependence, children need the necessary communication and co-operation skills. It may be necessary to teach these skills and allow children to monitor their own use of them.
4. These projects did not promote cognitive conflict. What occurred was verbal and physical assertion rather than discussion. For example, passive dominance of the keyboard, pushing a child's hand away, or *'Don't! It's my turn.'* This may have reflected the lack of co-operation and communication skills.
5. Strangely enough, resolution of conflict is not a necessary condition for cognitive restructuring and development. Resolution may in fact prevent the child from progressing, especially when a solution is *imposed*, the child giving in to the dominant person's wishes. Again this reflects the need for co-operative skills and a vested interest in each other's ideas and learning.
6. In Patricia Inder's class, the evaluation at the end of each session was invaluable for resolving interpersonal conflicts. This was in fact necessary for the groups to continue working together. In one particular group, at the end of their first session, they were sitting with their backs to each other and by session 5, one of the group reported *'I want to be in another group'*. The group complained that one child would get excited and physically take over the keyboard and make choices for the group which they did not necessarily perceive to be the right ones.

   By session 5, the researcher was trying to get them to focus on what happened when they did listen to what each other had to say and when they worked together. They told the researcher that, *'When we agree on the things, it's better cos you get to carry on.'* The researcher gave them some direction halfway through the session, suggesting that each have a turn on the keyboard when decisions about their own plant or animal were to be made.

   After this evaluation session, the group reported a very successful session the next day. Two of the comments made were: *'I asked Kim if I could press <return> and she agreed.'* and, *'I like working in this group now,'* (from the boy who wanted to change groups earlier on). In Ro Todd's study, however, the program had a motivational effect on interpersonal skills in 4 of the 6 groups and ensured they worked together successfully.
7. It was clearly important from these two studies that a computer program such as this should not be used in isolation, but rather integrated across the curriculum, so that the children have an opportunity to understand and work with the new concepts being discovered.

Notes

MS PATRICIA INDER was studying at the University of Otago at the time this research was carried out. She may now be contacted at Raumati School, Box 2055, Raumati Beach, New Zealand.

MS RO TODD was also studying at the University of Otago at the time this research was carried out. She may be contacted at the Dunedin College of Education, Private Bag, Dunedin, New Zealand.

A fuller account of this research was first published in *Computers in New Zealand Schools*, Vol.2, No.1, March 1992. Our thanks to the editors, Dr Kwok-Wing Lai and Dr Bruce McMillan, for their permission to work up this edited version.

The computer program used in this research is

Bank Street College Project in Science and Mathematics (1985) *The Voyage of Mimi – Ecosystems with Island Survivors (a computer simulation in ecology)*, New York: Holt, Rinehart and Winston.

Similar findings to those in these studies were reported in an investigation of a co-operative computer-mediated writing task undertaken by NZCER in 1988. See

Ashworth, D.J. and Atmore, D.L. (1989) *Collaborative Word-Processing: Evaluation of Exploratory Studies in Educational Computing. Study 12.* Wellington: NZCER.

Co-operative learning has been extensively researched by Johnson and Johnson. Most of the research indirectly mentioned in the first part of this *set* item can be found in their publications below, or has been done by others, to whom they refer. Readers of *set* may like to refer first to

Johnson, D.W. and Johnson, R.T. (1987) Co-operative Learning, Computer Assisted, *set* No.1, 1987, Item 13.

and

Johnson, D.W. and Johnson, R.T. (1987) Co-operative Learning Strategies for Mainstreaming/Integration, *set* No.1, 1988, Item 4.

then

Johnson, D.W. and Johnson, R.T. (1979) Conflict in the classroom: Controversy and Learning, *Review of Educational Research*, Vol. 49, pp. 51-70.

and

Johnson, R.T., Johnson, D.W. and Stanne, M.B. (1986) Comparison of Computer Assisted Co-operative, Competitive and Individualistic Learning, *American Educational Research Journal*, Vol. 23, No. 3, pp. 382-392.

and

Johnson, D.W. and Johnson, R.T. (1987) *Learning Together and Alone: Co-operative, Competitive and Individualistic Learning* (2nd ed.), New Jersey: Prentice-Hall Inc.

The ideas put forward in the section **Conflict and conflict-resolution** can be followed up in

Webb, N.M. (1982) Student Interaction and Learning in Small Groups, *Review of Educational Research*, Vol. 52, pp. 421-445.

The quotation there is from

Webb, N.M. and Lewis, S. (1988) The Social Context of Learning Computer Programming. In R.E. Meyer (Ed.) *Teaching and Learning Computer Programming*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, page 181.

That cognitive progress is low when two learners have the same strategies is discussed in

Mugny, G. and Doise, W. (1978) Socio-cognitive Conflict and Structure of Individual Performances, *European Journal of Social Psychology*, Vol. 8, pp. 181-192.

One value of computer mediated instruction is motivational: see

Cosden, M.A. (1988) Microcomputer Instructions and Perceptions of Effectiveness by Special and Regular Education Elementary School Teachers, *Journal of Special Education*, Vol. 22, pp. 242-253.

Another value for computer mediated instruction is that through it you can do the otherwise impossible: see Bruner in

Mayer, R.E. (1987) *Educational Psychology. A Cognitive Approach*, Boston: Little, Brown and Company.

Another value for computer mediated instruction is more peer-interaction: see

Johnson, Johnson and Stanne, above.

That the resolution of conflict among ideas is not a necessary condition for cognitive progress (**Conclusion**, 5) can be found in

Bell, N., Grossen, M. and Perret-Clermont, A. (1985) Sociocognitive and Intellectual Growth. In N.W. Berkowitz (ed.) *Peer Conflict and Psychological Growth: New Directions for Child Development*, Vol. 29, San Francisco: Jossey-Bass.

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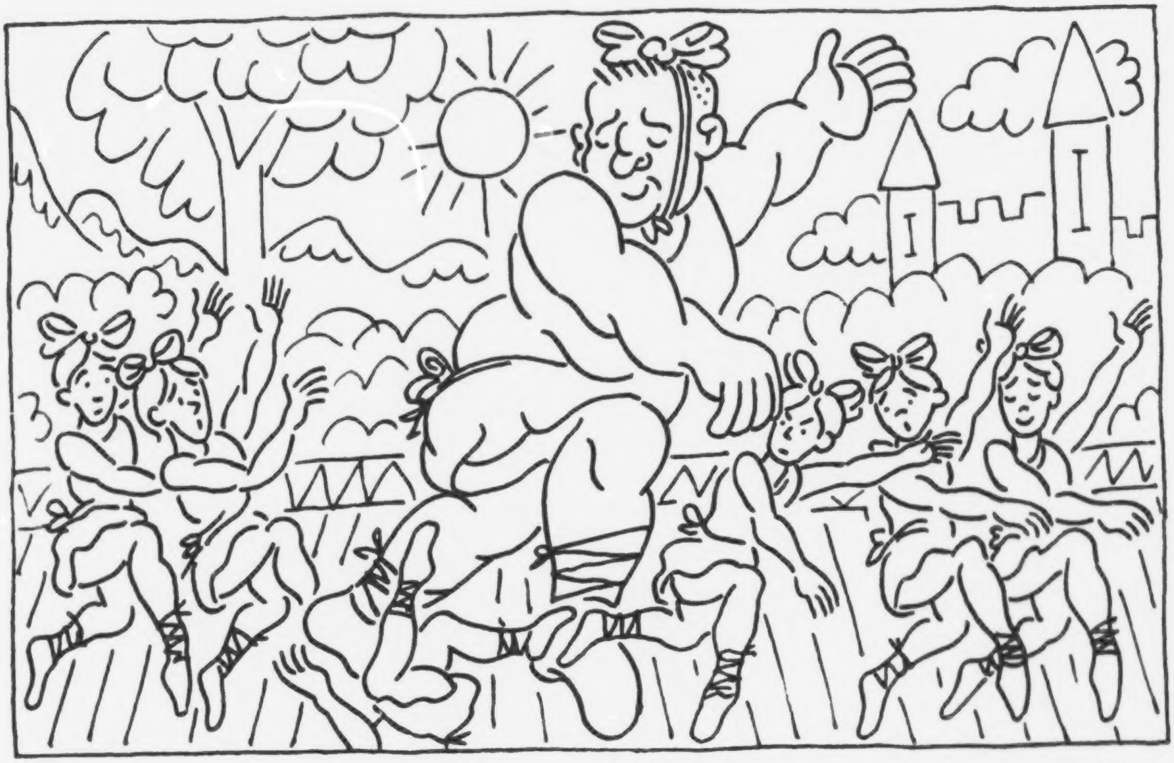
set
number two 1993

When Aptitude and Preference Mis-match

Neville Schofield
University of Newcastle, NSW



Jim Gorman

SOME CHILDREN learn best using a verbal format with verbal instructions and verbal explanations. By contrast, other children learn best when using visual material, with diagrams, pictures and perhaps maps. Still other children are quite comfortable with either mode. Children may have a *preference* for a particular style of learning but how does their preference fit with *ability* and *performance*? Does working in the way you prefer lead to better results?

A reliable scale for measuring a person's preference for either verbal or visual learning was developed by Kirby, Moore and Schofield in 1988. John Kirby and I used the scale in 1991 in an examination of practical map-reading performance. One aim was theoretical – to determine whether preference for one mode or the other had an impact on performance. A second was practical, to find whether a verbally based or a visually based strategy was more effective when you had poor performance.

Method

The young people we tested were three groups of 20 young soldiers (18-year-olds) who had just completed their basic training. They were shown an exact three dimensional model of a small piece of terrain and a spot on the model was pointed out. Figure 1 is from a photo of the model. Next they were shown the map (a standard 1:25,000 topographical map of part of NSW) and asked to find the same spot on the map.

For those who find maps difficult, in this ***set*** item we have put a line around the area of the map that the model also depicts, but it was not on the map the young men saw. You will quickly spot that the model shows the area 'upside-down' and you have to spin the map around 180 degrees to get them oriented the same way.

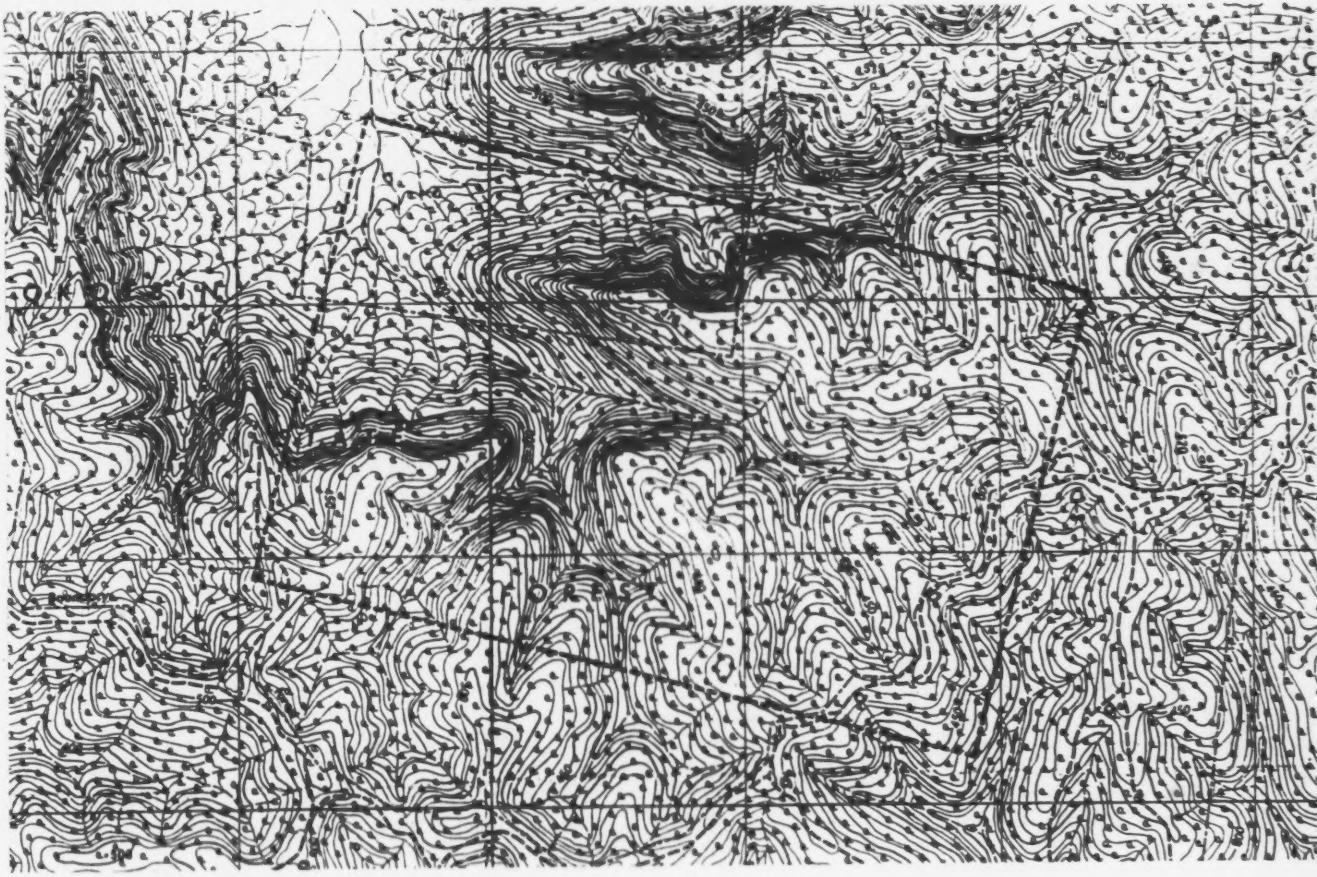
The time taken to identify the place on the model with the place on the map was noted. We also did a check on spatial visualisation ability using that section of the kit of *Factor Referenced Tests* of Ekstrom, French, Harman, and Derman. To find out if they preferred this sort of exercise to others, or if they enjoyed it, we used the reference measure we had developed. Thus we were going to find four kinds of people

Figure 1

3D Model of part of the Brokenback region

Figure 2

Topographical map, 1:25,000, Brokenback, Sheet 9132



First results

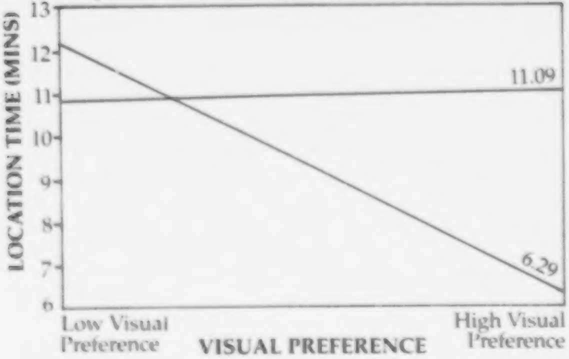
We found that people who had both high spatial ability and a preference for processing information in a visual form (Group 1 in Figure 3) took approximately half the time of those who had high spatial ability but did not like the visual form of processing (Group 2.) Those with low spatial ability, whether they had high or low visual preference (Groups 3 and 4), performed at approximately the same level as the high ability/low preference group (Group 2.) This can be expressed in a graph (Figure 4)

Figure 3

	Prefer visual	Do not prefer visual
Spatial ability HIGH	1.	2.
Spatial ability LOW	3.	4.

Figure 4

Spatial Visualisation Ability x Visual Preference



Thus, cognitive processing preference appeared to have a liberating effect on natural ability. If you have a natural ability, and enjoy (prefer) working that way, you will do better than other people. If you have a natural ability but for some reason prefer to work in a different way, then your ability is stifled. In our experiment we gave the subjects (the young soldiers we tested) a real-world task and the result was very clear.

For teachers

This result probably throws light on why **some** children you have taught, despite high ability in a particular area have, nevertheless, done poorly in it.

The big question is whether, to help a particular pupil, you should follow the child's preference or try to change that preference. For example, take a child in Group 2 who can manage spatial and visual information very well, but perhaps prefers to listen to verbal explanations and give answers in words rather than pictorially. The child is doomed to poor performance on spatial problems unless something can be done. Should the teacher try to turn the child towards liking and seeking visual information, or abandon that and help the child's verbal skills?

A clear answer can be given to this question from the second major result of our research.

Second results

We split the 18-year-olds into three groups. The first group (A) was given help in using visual strategies. The second group (B) was given help in verbal strategies. The third (C) were given no help at all – our controls. We then timed how long they took to locate another place.

Verbal help was found to be dramatically more effective than visual.

However, for the control group the results were surprising: those who had a strong **preference** for visual processing did as well as the Group Bs (who had been given verbal strategy training). Those of Group C who had a low **preference** for a visual way of working took twice as long as their high preference classmates.

This suggests that when individuals are left to their own devices to solve an actual task, processing **preference** is a key factor in success.

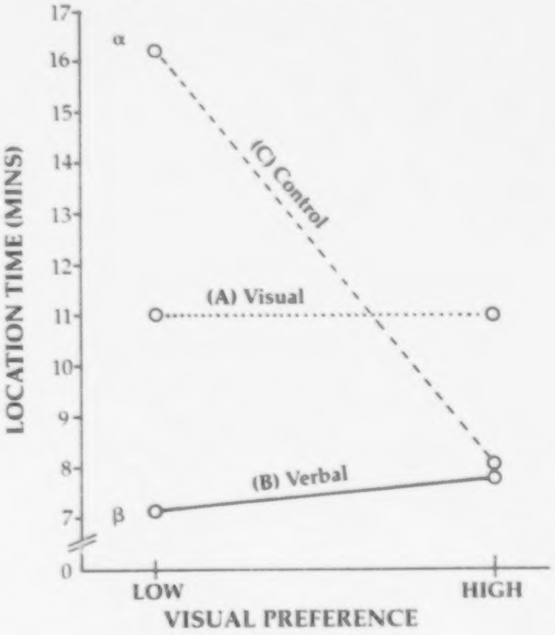
But the experiment also makes it clear that the powerful force of preference, when it is working against success, can be overcome by the teaching of an effective strategy. This is good news for teachers: children are not locked into failure by the learning way they prefer at present; and failure through inappropriate preferences can be overcome with strategies in the learning style they prefer.

This is seen dramatically in Figure 5 where the great difference is from point α to point β: teaching, using the right strategies, halved the time some students took to solve the problem. Here the graph shows that the visually low preference/low ability group (Group 4 in Figure 3), when given a verbal strategy, performed as well as Group 1 who prefer and have ability with visual things.

The converse result is not so clear from that experiment: visual strategies do not seem to have helped as much as verbal, even perhaps slowing down those students for whom a visual way of learning was already preferred. Later studies of actual map reading in the field showed that visually adept students took longer but were more accurate. As with all new skills, like learning to drive, once the strategy is incorporated, then speed and accuracy will improve.

Figure 5

Relationship Between Visual Preference and Location Time in Three Strategy Groups



Taking the findings further

Processing preferences exist and they have a major impact on performance. It is likely, then, that the information we give children is being filtered and distorted by their preferences for one way of dealing with the information or another. Consider the case of one apparently powerful filter that affects a large proportion of national populations: ethnicity.

All ethnic groups learn to perceive all aspects of life in a way that is different from other ethnic groups – that is part of what makes them ethnically distinct. That such preferences filter information and either impede or liberate performance seems certain. However, from our research, it seems likely that impeded performance can be ameliorated by providing effective strategies for the task at hand. This is a good thing for the learners, and for ethnic relations – it does not change the preferences (they always exist), it only changes the quality of the performance.

A number of examples from cross cultural studies in Australia appear to provide considerable support for this line of argument. In a series of studies, Kearins demonstrated that performance deficits previously recorded for aboriginal people on a wide range of tasks were, at least partly, due to cultural differences. This was true for even those tasks which were supposedly culture free, such as mazes. Kearins found that performance on visio-spatial tasks (which may have had their origin and relevance in a hunter/gatherer culture) was superior for aboriginal subjects over whites. In her tasks, subjects were required to accurately replace on a tray up to 20 items, some natural, some man-made. For one series of experiments, the verbal naming of objects was made difficult by having them all similar (coloured rocks). Aboriginal subjects consistently outperformed their white counterparts. This was true even for the aboriginals who had grown up in urban white environments without traditional contacts.

Kearins suggests that the reasons for these results may rest in differences as basic as child rearing practices which are culturally determined and which persist despite the apparent 'westernising' of other areas of life. She argues that her findings represent only a very small glimpse of what could well be a much wider set of skills and cognitive strategies which are otherwise obscured because of the cultural bias in both education and testing. Kearin's research supports the concept of an ethnically determined learning/processing style preference which filters information in such a way as to limit performance on a wide range of tasks. (At the same time, she is arguing that the ability may well exist but simply cannot be demonstrated.)

The idea that special training in a strategy (that fits the task) can overcome failure due to preferences, is supported in a study by Klich and Davidson. In a similar visual spatial task to that used by Kearins, the performance of aboriginal children at accurately repositioning items was again significantly better than that of white children. However, when the white children were instructed to form mental images of the array, their performance improved to be equal to that of the aboriginal children.

A second example of the effects of training can be drawn from the current research with both Australian Aboriginal and West African people, presently being undertaken by a team from the University of Melbourne headed by Helen Watson. They are examining a new method of teaching mathematics to children who come from a largely traditional tribal background. Such children generally have considerable difficulty in grasping mathematical concepts and, consequently, often fail to perform adequately in traditional western style education. Watson argues that it is not a lack of mathematical ability that hinders performance but the difficulty for these children to grasp the abstract thought processes associated with the basic concept of number. This derives from differences in language structure which lead to differences in the way objects are thought to exist. Imbedded in language, difficulty with maths is a cultural trait (not a lack of intelligence), and is very difficult for teachers to overcome.

Watson's experiments in Australia concentrate on using complex patterning associated with tribal names across generations. This patterning gives identity to individuals in the tribe: names reflect relationships and generation. Aboriginal children have been tutored in these relationships since birth and their pattern of thought reflects this way of organising the world. In the experimental teaching, values encoded in these relationships are linked with the values encoded in the mathematical registers of English. Thus a framework is developed for later mathematical education. Recent results suggest that the children in the study are learning normal 'white' mathematics successfully. From the western point of view, their innate ability was at first stifled but then liberated by accommodating their learning/processing style preference to the requirements of the task.

Conclusions

From both the map reading research and that of Kearins and Watson we can see that cognitive processing preference can actually obscure ability – people who are very good at doing things one way may actually prefer to do them another. In both my study and that of Klich and Davidson we can see that teaching the appropriate alternative strategy is able to overcome the effects of preference and allow adequate performance.

Ethnicity does appear to have an all-pervasive effect on patterns of thought and action for discrete groups in the community. The nett result of this effect is that abilities and performance, across almost every conceivable facet of human effort, can be inhibited or stifled, unless effective and sympathetic strategies are provided. In turn, this effect creates a dual challenge for educators. At one level, teachers need to think sufficiently laterally to perceive that particular cognitive barriers can be the result of filtered perceptions of the environment and habitual patterns of cognitive processing, rather than deficiencies in innate abilities. The second challenge is to devise effective strategies to address both the specific mis-match and the more generalised patterns of functioning which have led to the broad range of failure. Equipped with skills, all people can take effective control of their own learning environment and gain intellectual autonomy in what was previously an alien environment.

Notes

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This *set* item is based on a paper, *Cognitive Processing Preference: A New Dimension in Learning*, given to the annual conference of the Australian Association for Research in Education, November 1991.

A full report of the first research can be found in

Kirby, J.R. and Schofield, N.J. (1991) Spatial cognition: The case of map reading. In G. Evans (Ed.) *Learning and Teaching Cognitive Skills*, Hawthorn Vic: ACER, pp.109-125.

A report of the second research, and theoretical work about ethnic cognitive preference, can be found in

Schofield, N.J. and Kirby, J.R. (in press) Position location on topographic maps: Effects of task factors, training and strategies. *Cognition and Instruction*.

The scale for measuring preference for verbal or visual learning is

Kirby, J.R.; Moore, P.J. and Schofield, N.J. (1988) Verbal and visual learning styles. *Contemporary Educational Psychology*, Vol.13, pp.169-184.

The work of Kearins can be found in

Kearins, J. (1981) Visual spatial memory in Australian Aboriginal children of desert regions. *Cognitive Psychology*, Vol.13, pp.434-460.

and

Kearins, J. (1983) A quotient of awareness. *Educational News*, Vol.4, pp.18-22.

and

Kearins, J. (1986) Visual spatial memory in Aboriginal and white Australian children. *Australian Journal of Psychology*, Vol.38, pp.203-214.

The work of Watson and team in West Africa and Australia can be found in

Watson, H. (1988) Language and mathematics education for Aboriginal-Australian children. *Language and Education*, Vol.2, pp.225-273.

and

Watson, H. (1990) Investigating the social foundations of mathematics: natural number in culturally diverse forms of life. *Social Studies of Science*, Vol.20, pp.283-312

The Klich and Davidson study is

Klich, Z. and Davidson, G.R. (1983) A cultural difference in visual memory; On le voit, on ne le voit plus. *International Journal of Psychology*, Vol.18, pp.189-201.

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set
number two 1993

WORDS AND IMAGES

IN *PRINT* AND ON SCREEN

Lindsay Rollo
Wellington

COMPUTERS HAVE DRAMATICALLY expanded the options for preparing and presenting all types of printed and projected teaching material. These options are available to everyone, whether they have studied legibility or not. The results can be appalling and actually hinder learning. Here is some guidance from research.

Traditional printing conventions have developed over 450 years and followed 1000 years of calligraphy before that. Traditional practice has a lot to recommend it. So these notes, by and large, confirm and reinforce traditional practice.

All the recommendations are independent of both software and hardware. Many apply equally well to all text and graphic material — on the blackboard, on whiteboards, in overhead projector transparencies, 35 mm slides, on computer screens and video tapes.

Looking flash or being easy to type are not considerations. If your software or printer cannot achieve some of what is recommended here, be guided by this principle:
Make it easy for learners to grasp the content.

Prime Objective

Typography is

> the craft of rightly disposing printing materials in accordance with a specific purpose: of so arranging the letters, distributing the space and controlling the type as to aid to the maximum the reader's comprehension of the text.

So said Stanley Morison, designer of one of the most widely used, and imitated, typefaces, Times Roman.

Comprehension of the text is assisted by two elements:
(1) **Readability**, which concerns the choice and order of words — are the words and sentences understandable? This is the job of the writers and editors.
(2) **Legibility**, which concerns the selection and arrangement of type and space. This used to be the business of the printer or typographer — now it is the concern of everyone who has a computer. We all are typographers now, so remember this dictum:
Good typography is seamless – it does the job so well no-one is aware of it.

Page Design

The page is the basic unit of text presentation.

The combination of type, any illustrations, and space should present a cohesive combination that ensures optimal eye movement through the page, without distraction from unsightly spaces, poorly placed headings or illustrations, or unnecessary or over-emphatic typographical distractions.

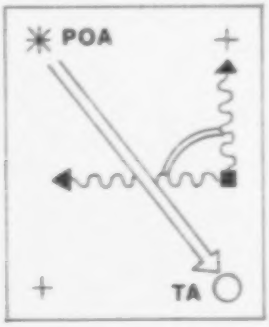
Reading Gravity

The first principle in page layout is that in the Western world we start to read at the top left hand corner of the reading matter and work our way across each line, then down one line, sweeping from left to right and back again, until we reach the bottom right hand corner.

Thus the reader's eye is trained to go to the top left hand corner and reading gravity carries it across and down the page to the bottom right corner. Between these opposite corners there is an axis of orientation (see Figure 1). Any typographical cueing or layout feature that causes the eye

Figure 1

Arnold's 'Gutenburg Diagram' charts basic eye movement from the Primary Optical Area (POA) to the Terminal Anchor (TA).



Crosses indicate fallow corners and the arc of wavy lines shows backward movement that the reading eye resists. (After Wheildon).

to move upwards, or to the left, through the page reduces both comprehension and speed of reading. Research by Wheildon confirms the importance of the concept of reading gravity, see Table 1.

Table 1

Effects of Reading Gravity

Reading gravity layout	Comprehension Levels Good %	 Fair %	 Poor %
Complying with principle	67	19	14
Disregarding principle	32	30	38

Page Proportions

Blank space is the most important aid to good page layout.

> The white space is not what is left over. It is part of the design. Text, illustrations, display type and headlines all need space in which to breathe and be effective. The space you allow between lines of type, between each headline and another, and between text and illustrations is important. (The Open Polytechnic of NZ).

Begin by using generous margins all around your material — use space to frame the message.

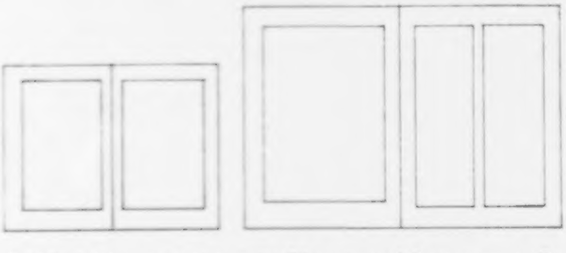
Traditional hard and soft covered book page sizes are close to 1.6 : 1 proportions. Usually, white space occupies about 50 percent of single- or double-page layouts. Ungenerous margins give a crowded impression, and may deter reluctant or un-skilled readers.

The A4 page presents particular problems. Older typewriters give each letter an equal space (hence the 'air' around l and i and the squashed look of m and w). The A4 proportions (1.4 : 1) are well suited to typewriter typefaces. This is also true of the American business paper size of 180 x 215mm (8.5 x 11 inches) which developed from the old quarto size. Tractor fed computer paper — the stuff with the holes down the side — is usually in an American size; make sure you get the right one for your computer printer. These paper sizes are not optimal for the proportionally spaced typefaces available today where l and i are narrow, m and w much wider, and other letters somewhere between.

Using two columns on A4 pages overcomes most of these problems, and provides additional flexibility in the size and placement of illustrations and choice of type size. It improves economy, and the smaller blocks of type appear to increase the amount of white space and so contribute to reader friendliness. This ***set*** item is printed on A4 pages, in two columns, each 88mm wide.

Figure 2

The text of traditional book sizes (left) and A4 (right).



Traditional layout puts tupe in 51 percent of the page area. On the A4 pages (right) it occupies 55 percent in the single column and 54 percent in the double-column examples. All examples are the same relative scale.

Paragraph Format

M.A.Tinker, one of the best known researchers into legibility, reports that comprehension rates increase 7 to 8 percent by using indented first lines to each paragraph. Indents for proportionally spaced type faces should be 10 points for 10 point type, 12 points for 12 point type, and so on. Such a space is still called an 'em' by printers, from the width of the letter m.

These indentations help the eye to recognise each new paragraph as the start of a new subject or that another component of the argument is about to the presented. It is not an accident that newspapers and book publishers indent the first line of paragraphs — it helps the reader. Indenting should also be used in typewritten presentation, even when using double line paragraph spacing.

Additional spacing between paragraphs is rarely necessary in text set in small type sizes in narrow columns. For text in more ordinary sizes — like the 9½ point of this ***set*** item, but with a wide measure reaching right across the page — an extra bit of space between paragraphs will help legibility; about half the height of a line is plenty. Too much inter-paragraph spacing destroys the visual cohesion of the page, as does excessive line spacing.

Selecting and Using Type Faces

Most proportionally spaced typefaces offered for use with computers are based on long established models. Some of these typefaces date back to the earliest days of printing (Bembo - 1492; Garamond -1620; Baskerville - 1750); others were designed to meet particular requirements (Times New Roman for *The Times* - 1932), or take account of contemporary computer technology (Stone for *Scientific American* - 1987).

Check that the typeface and the printer have all the characters and symbols you need. Some typefaces do not support a full range of punctuation marks, and would not be an appropriate choice for teaching material. Sciences have their own special symbols and these may not be in the printer or software 'character set'. Special character sets are available made up entirely of scientific and mathematical symbols.

Avoid using typefaces with fancy outlines or exaggerated curves, even for headings or titling, but especially for extended text. They will be hard to read. Typographers refer to 'text faces' and 'display faces' and it is a good distinction. Display faces are used in advertisements and fliers. Almost all text faces make good headings too, so display faces can be left on the dealers' shelves.

When selecting a type, middle-of-the-road values become a virtue, and novelty a nuisance.

Size Selection

Good software and good printers come with their typefaces in outline - actually a mathematical formula which reduces or enlarges the type size as requested. These are called outline, or scalable, faces. Sometimes they will be called scalable **fonts**. A font is a subset of a face: **Times** is a face, it comes in many sizes and weights; **10 point bold Times** (that's it) is just one font of **Times**; *10 point italic Times* (that's it) is another. When the sales leaflet says, 'Our wonder-printer has 50 resident fonts!' check carefully — it probably means it has only one size of 3 faces in various combinations of italic and bold, and perhaps a pretty useless display face or two. Getting a single good typeface in scalable sizes, is 100 times more useful.

How do you select the appropriate size of text for your audience, wasting no space, but keeping it readable? The first rule is that small children (new readers) need large type. After that the decisions get more interesting. Some typefaces look more crowded than others, and some do indeed pack in more letters in each line. Italic type saves space, but is tiring to read in large chunks; capitals (upper case) use up a lot more space, but they are much less readable. So italics and capitals are best used for occasional emphasis only. Bold takes up more space than medium weight letters but is just as readable.

The main readability difference between different faces lies not in the shapes of the letters themselves so much as the white space between and above and below. Therefore, typeface designs with long ascenders (b, f, l, h) and long descenders (p, y, q, j) look open and light compared with typefaces which have short ascenders and descenders. The contrast can be seen in the several examples that follow. If you have a choice of typefaces it is again best to choose the older less cramped faces for children. Edit and shorten the text before you reduce the type size below 9 point.

Figure 3

Examples all set in the same point size.

Times: abcdefghijklmnopqrstuvwxyz
Century Book: abcdefghijklmnopqrstuvwxyz
Sans serif: abcdefghijklmnopqrstuvwxyz
Typewriter: abcdefghijklmnopqrstuvwx

Note the differences both in the relative size of the characters, and the visual density of the examples on the page.)

Figure 4

Samples are set in the same nominal type size (12 pt).

Sample Settings

Type A
To make the best use of this expanded resource font base you have to make informed typographical choices. Font choices must first match the audience.

Type B
To make the best use of this expanded resource font base you have to make informed typographical choices. Font choices must first match the audience.

Type C
To make the best use of this expanded resource font base you have to make informed typographical choices. Font choices must first match the audience.

Type D
To make the best use of this expanded resource font base you have to make informed typographical choices. Font choices must first match the audience.

Sample A is about 18 percent more economical than B or C, and requires less leading than any of the other samples. It would have to be set about 1 point larger to have the same perceived size as Samples B and C. It would then lose its setting advantage.

Sample C shows that sans serif faces are not necessarily more economical than serif faces. Sample D, a standard typewriter face, provides contrast and demonstrates that typewriter faces need a wider measure to be read to advantage.

Figure 5

Differences in x-height, and the length of the ascenders and descenders.

pxl pxl pxl

Decide on the type size by the appearance on the page. With computers it is marvellously easy to try a few sizes and decide which is best, at virtually no expense. If you like a typeface (or are forced to use one) that has short ascenders and descenders, a large 'x' height, and a dark look on the page, you can make it more readable by adding white space between the lines. This is called leading, after the strips of lead hand-craft printers once used between lines of type.

Most printers can accommodate changes in line spacing (leading). But beware - some word-processors automatically add 2 points of leading whenever proportionally spaced type is selected. This can lead to excessive spacing. Assess each typeface on its merits, and not by a formula. For example, many versions of Times need less leading than 2 points — 1 point is plenty; but Century Schoolbook, another face often supplied, needs 2 points. The inter-letter spacing also need checking: Times is frequently set too tightly and needs a small increase (1.5% to 3%) to stop adjacent characters appearing to run into one another.

Finally, there are the differences in the relative or apparent density of the type as it appears on the page. This is caused by the varying thickness of the strokes and serifs of each letter. Times is fairly dark, Century is much lighter. Denser or more robust typefaces generally need more leading than lighter faces. We are surrounded by books and almost every one has a different combination of size, width, weight and leading of type. And in libraries there are plenty of books on typography and graphic design with samples of typefaces that can help develop judgement about legibility and the beauty of print. Many children enjoy these too.

Items for students with limited English or limited reading skills should use simple clear fonts, and use slightly larger than average type sizes and err on the side of more leading. The pupil can then concentrate more on the context, and less on deciphering the characters.

An excellent exercise is to create a test sample of text, about 100 words, using a moderate line width, and get the computer to copy it several times on the same page. Then apply each of the available fonts, one to each sample. This creates a visual aid to making judgements about which size, face, and leading is most appropriate for your purpose, and which best combines clarity with economy. Figure 4 is a short example.

The aim is, always, to achieve clarity.

Serif or Sans Serif?

Times or Universe? for example. The researchers have found clear answers. Tinker has summarised the research; it shows: (1) serif type (e.g., Times or Century) is superior as measured by **speed** of reading. (2) Wheildon's research clearly demonstrates serif type is superior for **comprehension**. (3) Hvistendahl and Kahl's results record readers' **preference** for serif type. This re-enforces 450 years' experience of printers and publishers.

Researchers believe serifs also help to channel the eye movements across the page, and so help the continuity of the reading process. Research clearly shows that serifs help to distinguish characters of similar appearance, such as g,q; h,k; o,e,c; i,t. Even in serif typefaces, some capital letters, such as B, G, and Q are often confused with R, C, and O. It is easier to misread 'tum' for 'turn' in a sans serif type such as Universe than it is with a seriffed typeface. This type of error is more frequent in smaller type sizes, or when words are read from an oblique angle.

Sans serif faces should not be used for extended text. They are useful for contrasting captions to illustration, diagrams, and the like, although italic type can be used very effectively for this purpose and will preserve visual cohesion.

The argument that sans serif type is modern and uncluttered is irrelevant.

Modernity is not a typographical rationale in itself; fitness for purpose is paramount.

Proportionally Spaced Typefaces

Virtually all computer printers, including dot-matrix printers, provide proportionally spaced typefaces. Words printed with these faces are read more quickly than typewriter-style mono-spaced typefaces, such as Courier, and without loss in comprehension. While there is still a place for mono-spaced faces, particularly in tabular work, use proportionally spaced typefaces if they are available. Fortunately, some laser printers have a mono-spaced serif font that matches one of the proportional fonts, providing the best of both worlds for tables.

When using proportional faces, abandon certain typewriting conventions, such as the double space after a full point (stop). The double space was necessary with mono-spaced type to give a clearer visual signal that the end of a sentence had been reached. These double spaces become very noticeable; they interrupt the flow of the eye along the line; and if two or more appear close to each other in succeeding lines, they can give the appearance of a 'hole' in the text.

Optimum Line Length

'The line should contain between 1½ and 2 alphabets, that is 39 to 52 characters' says one typographer. Another says the line (in ems) should not exceed 2.5 times the type size (in points) — lines of 10 point type should not exceed 2.5 x 10 = 25 ems (105mm). Both 'rules of thumb' are generally supported by research.

Tinker reports that, for any given type size, line length can vary considerably without affecting legibility, as measured by reading speed. For example, 10 point type is equally legible in lines from 66 to 110 mm wide and 12 point type is equally legible from 66 to 140 mm.

Leading also has an influence. Adding 2 points (less than a mm) of extra white space between lines of 10 point text increases the line length readability.

Avoid extremes of line length and type size. Very short measures with larger type sizes, and longer measures with smaller sizes, reduce reading speed.

Ragged Right or Justified?

Use unjustified text (ragged right) in material prepared specifically for pupils learning to read and for poor readers. Professor Marie Clay comments:

> many lines are one sentence lines and many breaks are made at syntactic breaks (phrases) to help the reader with the grouping of the words. Strangely enough when I asked teachers at what point the books change to right justified print I found that most teachers were not even aware of the shift, and they certainly did nothing to prepare children for it. The shift seems to be made by young readers without anybody noticing it very much.

Some researchers have found no differences in reading speed between ragged right and justified text but Wheildon's research shows clear advantages in justified text for competent readers (see Table 2).

Table 2

Effect of Justifying Text

Layout Setting	Comprehension Level Good %	 Fair %	 Poor %
Justified	67	19	14
Ragged right	38	22	40
Ragged left	10	18	72

The traditional printing practice of justified type enhances visual cohesion of the page. Some commentators believe that the uniformly defined right hand margin is sub-consciously identified in the peripheral vision and alerts the reader to the impending transfer to the next line.

Good word-processors provide justified text immediately, without time or effort. For long texts the cost advantages in space saving by justifying is a bonus.

While hyphenation is almost always necessary in justified text, excessive hyphenation is a signal that an inappropriate type size or line length is being used.

Emphasis

Typewriter technology allowed few options for emphasis: capital letters and underlining. Underlining was a substitute for italic type. Computers allow a full range of typographical emphasis - variations in type size, italic and bold fonts of a typeface, using more than one typeface, a variety of symbols (bullets, diamonds, solid and open squares, etc.), together with spatial cueing by centred headings, cross headings, and side or shoulder headings, various levels of indentation, and numbering.

RESEARCH RESULTS ARE QUITE CLEAR: TEXT, OR WORDS, SET OR WRITTEN ALL CAPITALS, ARE VERY SIGNIFICANTLY LESS LEGIBLE THAN TEXT SET IN LOWER CASE. AVOID FREQUENT OR EXTENDED USE OF CAPITAL LETTERS ALONE. USE THEM SPARINGLY, AND ONLY FOR BRIEF TITLES, AND NEVER IN LISTS, TABULATIONS, OR SOLID SENTENCES.

SMALL CAPITALS (x height) are another resource for the good typographer. Acronyms and the like can be set in capitals and small capitals, or all small capitals, and provide the necessary typographical distinction without undue emphasis (NZCER; CSIRO; ASCII; IBM; UNESCO).

There is no reason to use underlining in computer-generated text. Do not use it. Not in headings, not in text. Use italic fonts for foreign languages, including the binomial (Latin or Greek derivation) names of plants and animals. There will also be occasions when italics can be used to distinguish, as distinct from emphasise, words or phrases.

Some dot-matrix printers cannot manage italics but most can manage bold (perhaps called 'overstrike'). But beware - many bold fonts provide too much emphasis, and excessive use of bold fonts induces a spotty appearance on the page, or gives the appearance of shouting at the reader. There is some evidence that headings that catch the eye distract the reader from the text, to the detriment of comprehension.

The careful selection of the type size for headings, combined with spatial cueing, **all in one typeface**, is most likely to provide effective, non-intrusive, typography. ***Write for emphasis; display for clarity.***

Laser printer publicity frequently emphasises the number of screen dot or grey scale options available. These are important in reproducing photographs and wash effects in drawings. But they are frequently mis-used as panels behind a portion of text. The shaded portion of the page certainly stands out, but the text printed in the shaded box is significantly less legible because the dots corrupt the outline of the characters and words, and the grey scale reduces contrast between the paper and the type.

Using lines above and below a special statement, or including it in a box, is acceptable. Resist the temptation to use heavy lines. The fact that there is a typographic cue to attract the eye is usually sufficient to signal to the reader that the passage identified has some special significance.

Tables

Display printed tables with the least number of lines possible. Some word-processors provide table creation features organised on a cell basis, like spreadsheets. They present the table on the computer screen with lines around all the cells, and can be printed out in this format. However, removing lines allows the eye to run across or down the table without interruption, so small tables may not need any lines at all. When tables are a minor part of the total text, aim to make them as unobtrusive as possible; this way they will not interrupt the narrative or logic of the presentation.

If tables are long, and particularly if the data displayed has a regular sequence (e.g., conversion tables, time related sequences), mark off each five lines with a one-half or one-third line space. This helps guide the eye across the page.

Label all tables. They should also be numbered if there is any possibility of confusion, especially if tables cannot be displayed adjacent to the relevant text. If tables are numerous, group them on separate pages. In a few cases, group the tables at the end of the text, particularly if the points exemplified in the tables have been stated in the text.

Traditionally table captions appear above the table; captions for figures - graphs, diagrams, and illustrations - appears below the item, but this is not very important. Consistency is best - all above or all below.

Paper and Contrast

Black ink on plain white paper is still the best basic approach. Reversed-out text (white on black) is much harder to read.

Photocopying has its legibility hazards. Xerography tends to weaken thin portions of letter strokes, and thicken broader strokes. Paper surface also has an effect. Many photocopy papers have a relatively rough surface, and this breaks up the outline of characters and gives a fuzzy appearance. Making a master copy for photocopying is a good idea - a laser printer copy on matt art paper reduces the disadvantages. Using glossy paper does not help legibility - the light reflected off the paper makes the message harder to read. Many laser printers have difficulty in handling glossy paper. If you need a fine surface to reproduce detail in illustrations, use matt art paper.

Re-cycled papers usually have less contrast than virgin paper because of the difficulty in removing all the ink used previously, and so need stronger typographical treatment, for example, using typefaces with thick strokes and big counters (the hole in the 'e', 'a', etc).

Another trap is the use of textured and tinted papers. Some papers have a contrasting, coloured, randomly distributed, fleck or mottled pattern; or they may have varying degrees of surface embossed patterns. While these features have little effect on large size titling, they can almost destroy the integrity of standard sized text material. When using tinted paper or transparencies, select background hues that provide the strongest contrast with black ink, e.g., lemon or canary; ochre; light green, blue or pink.

Projected Teaching Materials

Because a combination of what is seen and heard is more effective than seeing or hearing alone, multimedia combinations are very useful in teaching. They are becoming cheaper and easier to create. Already some expensive computer equipment will project the screen images, and colour printers are available (but expensive to buy or expensive to run.) Meantime, overhead and slide projectors are what most teachers and lecturers have.

No matter what form of presentation is used, an appropriate typeface will make projected images easier to read and to be comprehended quickly and accurately. For projected images, sans serif faces may be easier to read than most other type faces. This is against the usual advice, the research is not clear, try different styles yourself.

Classroom Conditions

No viewer should be more than six times further from the screen than the height of the image on the projection screen. If the image on the screen is 1 metre from top to bottom, no child should be more than 6 metres from it.

Creating charts that are mostly words

Keep the text concise. Limit each chart to one idea and use strong verbs, short words and short sentences. In introducing new subject matter to a class, use no more than eight words per point, and use space rather than bullets to separate points - but be consistent first.

Creating Diagrams and Graph Charts

Omit all unnecessary details and lines. Round numbers up or down to match the level of displayed detail. Use short titles that summarise the subject.

Try and limit any graph to four lines, two is best. Make lines very easily distinguishable from each other; coloured lines have an advantage when one or more lines cross others in the chart. Make the trend or data lines thicker than the axes, and minimize both the number and thickness of any grid lines.

Bar and Pie Charts

Take particular care with bar charts, both printed and projected. Many software packages can display them as horizontal, vertical, stacked, clustered, overlapped, and paired bars, or percentage elements, using a wide range of textures, patterns or colours. With so many resources to choose from, resist the temptation to use too many. Keep all charts simple.

Keep the textures or colours well differentiated within or between bars, and use the same texture/colour for the same data across all sets of bars in a related series.

Distinguish between positive and negative values with different colours.

Use darker or stronger colours or fill patterns closer to base lines, and graduate to lighter colours further from the baseline. Use darker, stronger colours and fills on the left of clusters.

Keep the number of segments in a pie chart to six or fewer; place the most important segment in the upper quadrant or arrange the slices from the largest to the smallest in a clockwise direction. Emphasise one, at most two, particular slices by cutting them away from the pie and/or using a high-contrast colour.

Be careful when using pie charts to compare two situations. Be sure that the comparison is easily grasped visually. The eye has difficulty in comparing areas. It might be better to use a bar graph.

Labels should be kept short and placed within segments; but display percentage values next to each slice.

Colour Combinations

Colour in presentation can be a boon, and a hazard.

Overhead transparencies and paper presentations work best with dark text on light backgrounds. Black on white is still the best for these purposes.

For projected images, do not use too many colours. In creating a straightforward text chart, limit it to three colours: one for the background, one for the heading and any highlighting, and one for the text. If you need more than five colours in a graph, it is certainly too complicated.

Use the same colours consistently throughout a presentation – your students will find it easier to relate comparable data, and it creates a unified and professional appearance.

Text and background should be in contrasting colours. Again in contrast to paper and OHPs, computer screen graphic work and 35 mm slide presentations work best with light text on a dark background.

Use complementary colours and ensure that the colour scheme chosen is not harsh or tiring to look at. Do not use red/green combinations for highlighting data - because of colour blindness, a significant proportion of the male population cannot differentiate between these colours.

Some colours have associated connotations, including amongst others - red for danger or stop; blue for cold; yellow for caution and cheerfulness; and white for purity. These associations are entirely Western associations. Presentations to other cultural or to ethnic groups should be checked for their specific connotations or conventions.

Notes

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Acknowledgements

He acknowledges the assistance from the staff of the Auckland Technical Institute, The Open Polytechnic of New Zealand, the Printing Industry Training Committee, and the Wellington College of Education, and librarians at the New Zealand Council for Educational Research, the National Library of New Zealand and the Wellington Public Library, and the editor of **set**.

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Wright, Patricia (1977) Presenting Technical Information: A Survey of Research Findings. *Instructional Science* (6) 93-134. Includes an extensive bibliography.

There are innumerable books on desktop publishing. Many are written to support particular software programs. These frequently concentrate on how to use the program, rather than the principles to guide a choice between options. Each title in the short list below gives some background to established publishing practice, frequently supported by references to research. All titles are available from libraries. Read them for the principles discussed. Do not ignore the portions dealing with specific equipment or programs; ask yourself the question 'Do I want or need to be able to do this function with my equipment or program?' and then set out to find the relevant section in the manual. With luck it might be there.

An outstanding summary of research on the subject, and the starting point for researchers to this day is

Tinker, Miles A. (1963) *Legibility of print*, Ames: Iowa State University Press.

Outstanding for its coverage of type selection, and easily understood by beginners, is

Brown, Alex (1989) *In Print Text and Type in the Age of Desktop Publishing*, New York: Watson-Guptill Publications.

Probably the best single general introduction to desktop publishing is

Simmonds, D. and Reynolds, L. (1989) *Computer Presentation of Data in Science*, London: Kluwer Academic Publishers.

Do not be put off by the title - it includes information on OHP's, presenting tabular material, and a valuable reading list. Linda Reynolds is also the author of 'Legibility Studies: their relevance to present-day documentation methods'. [*Journal of Documentation*, 1979, Vol. 35, No. 4, pp. 307-340] This review paper summarises research results on legibility, including work carried out since Spencer's *The Visible Word* was published. It has an extensive bibliography.

A book covering a range of practical examples, such as press releases, overhead transparencies, advertisements, brochures, and printing in colour, based on the research recorded in Wheildon, above, is

Webster, T. and Larter, B. (1989) *Design and Layout in Computer Publishing*, Sydney: Webster and Associates.

A guide to the commonest stylistic, typographical and grammatical errors encountered in desktop publishing are

Williams, Robin (1990) *The Mac is Not a Typewriter*, Berkeley, California: Peachpit Press.

or

Williams, Robin (1992) *The PC is Not a Typewriter*, Berkeley, California: Peachpit Press.

Design pupils will find the long respected *Visible Word* very attractive and helpful. It ends with a section called 'Towards a new alphabet' which will intrigue those with a penchant for codes and secret alphabets as much as design conscious art students and English teachers.

Spencer, Herbert (1968) *The Visible Word, Problems of Legibility*, London: Lund Humphries.

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set
number two 1993

What Principals Think of Their Beginning Teachers

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Jennifer Lautusi

Our aims were

- ❑ to find how satisfied principals were with the beginning teachers, they had chosen;
- ❑ to find out how beginning teachers might teach better in their first two years of teaching.
- ❑ what strengths, if any, did beginning teachers show?
- ❑ were there any common weaknesses colleges could help overcome?

IN DECEMBER 1991 we attempted to contact all the primary principals who had employed beginning teachers from the Auckland College of Education (ACE) since 1989. (Prior to 1989 principals were not directly responsible for whom they employed.) Our study is part of an on-going research project, earlier work having been published in ***set*** in 1990 and 1992.

The study had two parts, a questionnaire about which we report here, and individual interviews with 20 principals, which will be published elsewhere.

The Questionnaire

We needed to ask about issues and questions of significance to those who are directly involved in teaching so that the research will be of interest and value to teachers. Therefore we designed the questionnaire jointly with an advisory group of school principals.

The questions focused on three types of tasks teachers have to do and on personal qualities. Teaching is more than skills and techniques; it is, essentially, a moral and ethical undertaking. So in the section on personal qualities we included interest and concern for pupils, integrity and trustworthiness, personal commitment to teaching, and the willingness to learn and to seek help. There were also 14 items which assessed professional skills such as curriculum knowledge, planning and organisation, and classroom management. We also had one item on handling administrative tasks.

The first section of the questionnaire (quantitative) asked principals to rate their beginning teachers as 'outstanding' 'very satisfactory' 'satisfactory' 'showing some problems' or 'unsatisfactory' for each of the 22 items. There was also an opportunity for the principals to add their own observations and comments.

The second section (qualitative) asked them to comment on specific strengths and weaknesses shown by their beginning teacher which they considered could be attributed to their courses at college.

We knew of 228 schools who had employed our graduates in 1989 and 1990. Some had more than one. Seventy-eight percent of schools responded and we got reports from principals on 255 beginning teachers.

The Results

Table 1

Principals' Ratings of Beginning Teachers

	Outstanding	Very Satisfactory	Satisfactory	Some Problems	Unsatisfactory
Personal qualities	33.7	43.4	17.5	4.6	0.8
Professional skills	22.7	43.4	25.0	7.5	1.4

Quantitative

Closer analysis showed that 14 percent were having some difficulties with behaviour management. Principals' comments indicated that they were aware that this is a complex task: 'All beginning teachers find managing a big group of kids a challenge' said one. Principals' ratings of the 22 attributes were then analysed separately.

Personal Qualities

Principals appreciated the personal characteristics of their beginning teachers most. Four out of six of the personal qualities we asked about were at the top of their lists. The next attributes were participation and co-operation, also reflecting personality.

However one personal attribute showed considerable deviation, and was significantly different from the others in this category: over 9 percent of beginning teachers were seen as having some interpersonal problems. Supporting comments from principals suggest that learning to get along with colleagues is difficult for a significant minority of beginning teachers. 'Teaching is good, but interpersonal skills and respect for fellows is lacking.' 'Needs to be more sensitive and aware of her place in the total scheme.' 'Needs to communicate with staff on a wider basis.' 'Has excellent future if keeps opinions to herself.' These were typical.

Several commented that while beginning teachers are understandably enthusiastic and eager to implement their ideas, their needs and wishes need to be balanced with the overall goals of the school, the resources available and the wishes of other teachers. As one put it 'The most important thing is that the trainees do not come into schools thinking that they have ideas and principles that take precedence over what the school wants.'

Professional Skills

The ability to create a positive learning environment is the most highly rated professional attribute of these beginning teachers. This is followed by a willingness to learn and to seek help. Classroom organisational skills are ranked next. Curriculum knowledge is the lowest ranked of the professional attributes. That is, principals feel that these young teachers know how to get the kids working but they need more knowledge of what to teach and how to teach it effectively.

Two of the professional attributes need comment: communication skills with colleagues were not good enough (also mentioned as a personality problem), but their attitudes to equity issues were better than perhaps expected.

Classroom management skills, basic administration, programming for special needs, and curriculum knowledge create the most challenge for beginning teachers, the principals say.

A minority (10 percent) of beginning teachers need to manage administrative tasks more effectively. Twenty principals indicated that this was an area which could be improved. 'There is a lot of admin and we expect people to do it.' Several said their beginning teachers had difficulties with time-management, particularly meeting deadlines.

Qualitative Data

Overall Performance

Principals were invited to make an overall comment about the overall performance of their beginning teacher: 209 did so, and 132 were unreservedly positive, making comments such as: 'Her level of professionalism and depth of understanding is quite outstanding.' 'Outstanding teacher with the best class control in the school.' 'Intuitive. Has the X factor. Motivated, sensitive and dedicated.' These, and many others, express high overall satisfaction.

Fifty principals made comments (on 20% of these young teachers) that, while generally positive, indicated that their beginning teachers had required assistance to develop. Some took a while to settle into their new roles but with guidance they developed into satisfactory teachers. This is reflected in comments such as: 'Most problem areas have been converted to *very satisfactory* by tutor guidance'; 'Took a while to mature'; 'Initially had trouble asking for help, but not now'; and 'Took until second year to fully participate – now an asset to the school'. Six percent identified some ongoing difficulties: 'Most satisfactory, but lacks wider vision and ability to accept criticism' and 'Mostly pleasing start, but some weaknesses in initiative'. Six commented on the well known tendency for new teachers to 'catch every disease going' and one mentioned 'tiredness due to health problems'. Some beginning teachers were seen as too intense about teaching: 'A super girl who needs to work a little less'; 'Needs to be less emotionally involved'; and 'Very capable teacher but is too idealistic and sets too high goals'.

Interestingly, several principals found that the well developed personal attributes of their beginning teachers masked teaching difficulties: for example, 'Some problems in basic planning and records which were hidden by bright personality'; and 'We have loved her, but it's personality getting her through'.

Several principals pointed out that their beginning teachers did not easily make the transition between being a student and becoming a teacher. Some beginning teachers were unprepared for the amount of 'sheer hard work' required from them at the beginning of the year and were shaken by having almost total responsibility for a group of children on an on-going basis. One beginning teacher 'initially suffered from not having the reality of the classroom impressed upon her.' Others started off well, but had problems sustaining the effort required.

What about the four students that principals rated as unsatisfactory overall? Remember that these beginning teachers, under the new system in New Zealand, had been appointed on the advice of the principal now writing about his or her own choice. One of them was assessed as being

'A disappointing teacher overall. Has had enormous help from a teacher whom I consider to be very highly skilled. Despite this she continues to disappoint'. (This person was appointed by an earlier principal.) Another appears to have refused to accept the philosophical values of the school and may have performed better in a school which was closer to his particular value system. The third principal felt that he had been 'misled by the college report.' As did the fourth. He characterised one of his two beginning teachers as 'a lazy, self indulgent, immature girl. She has not shaped up as a professional and should in my opinion not have graduated – the class has fallen further and further behind'.

Specific Strengths and Weaknesses Attributable to the College Programme

Fewer principals chose to answer this section, possibly because, as one principal said, 'Not being familiar with the Auckland College of Education curriculum it would be difficult to say what "caused" the performance'.

Principals mentioned mostly personal qualities such as enthusiasm, attitude towards children and youthful energy. It is unlikely that these qualities result from their college programme. Some said their teachers had 'an up-to-date focus on current trends in all curriculum areas'. Strengths in specific curriculum areas were rarely mentioned and certainly followed no pattern. Fourteen principals mentioned gaps in key curriculum areas, for example 'Lack of knowledge of programme content and resources'.

The area of most concern to principals was that of basic administration. Twenty principals pointed to weaknesses in carrying out the routine tasks (and time management skills) which are required of teachers. Assessment and evaluation of children's work and the need to monitor standards was mentioned by twelve principals. Report writing was another area mentioned.

Several principals acknowledged the critical importance of on-going support and guidance provided by tutor teachers. In some cases they felt that this had not been adequate.

Several felt that skills in communicating with parents needed development. One principal, in a country area, pointed out the need for confidentiality in social situations particularly in a small community.

Discussion

This research shows that by and large principals are very satisfied with their (own) choices of beginning teachers. They found personal qualities better developed than professional skills, which is not surprising: beginning teachers have had at least twenty years learning to be people, and only a short period learning to be teachers. There is also a possibility, although we have only anecdotal evidence for this, that some principals may select their beginning teachers on the basis of personal qualities, rather than professional skills. Personality is, after all, the more obvious in interviews.

Assistance

How can we assist beginning teachers to function better in the classroom? The study does not provide any definitive answers but does point to some areas that could be developed.

In colleges we need to strengthen the development of effective professional skills. This must include a sound knowledge of curriculum, planning, assessment and evaluation skills, and communicating with parents. We may need to look more closely at the area of interpersonal skills.

The survey points to a need for college staff to prepare students for the complexities of teaching. This is a real challenge because becoming a teacher is a highly idiosyncratic process, dependent upon personal background and personality and upon fitting into an (as yet) unknown school context. A good way may be to assist teachers to analyse and talk about their own teaching with a view to improving the quality of learning in classrooms. Professional action involves 'making judgements in situations of unavoidable uncertainty.'

This study also raises questions about what Colleges of Education are supposed to teach. Most school administrators hold the view that effective teacher education prepares students to fit into the existing norms and practices of schools. This is the 'good employee' model – students are trained to slip unquestioningly into the teacher's role. Our principals' responses suggest that they prefer beginning teachers who accommodate easily to the particular culture of their school. A survey of secondary school principals in 1990 supports this view.

Certainly our principals' comments indicated that they had a low tolerance for beginning teachers who challenged current practices. Yet, questioning the apparent 'givens' of schools, can be a helpful impetus towards school development. Some beginning teachers obviously got 'offside' with their colleagues because of their outspokenness and what was seen as insensitivity to others. Fitting into 'the way we do things around here' is not always easy for a new staff member. It can be particularly difficult for beginners since they are juggling many new responsibilities at the same time as they negotiate a new role for themselves.

New Zealand principals expect to provide support and guidance to beginning teachers; their replies showed that. When young teachers do not get support and guidance becoming a teacher is inordinately more difficult, and can overwhelm. In the USA, 30% of beginning teachers fail to make it to their second year. Few of the beginning teachers in our survey were in this position. We hope this reflects both their teacher education and the guidance provisions built into the system.

There are definitely general needs and concerns about classroom management, teaching children with special needs, and working with parents. Structured programmes of assistance from outside the school during the first two years of teaching may need to be added to the education system.

The study identifies the need for the principals and tutor teachers to induct beginning teachers into their school's particular administrative ways. Pre-service (college) courses can give only generalised help. Young teachers need to cope effectively with 'the paperwork'.

Missing from this survey, of course, are the perceptions of the beginning teachers themselves. Research in progress should give an added dimension to our understanding of the transition between college and classroom.

Notes

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Lexie Grudnoff is Director of the School of Primary Education at the Auckland College of Education.

This research can be read in more detail in a report , *Principals' Assessments of Their Beginning Teachers*, published by Auckland College of Education and available from the authors.

A useful summary of research on beginning teaching, including comment on the gaps in that research is

Reynolds, A. (1992). What is competent beginning teaching? A Review of the literature. In *Review of Educational Research*, Spring Vol.62, No.1, pp.1-35.

Discussion section:

The full quotation 'making discretionary judgements in situations of unavoidable uncertainty' is from

Schon, D. (1987). *Educating the Reflective Practitioner*. San Francisco, Jossey-Bass.

Interpersonal skills feature in the *New Zealand Curriculum Framework* recently promulgated.

Auckland College of Education has attempted to address the issue of how to prepare students for the complexities of teaching with a new course in pedagogy at the 3rd year level.

The view of most school administrators, that effective teacher education prepares young teachers to 'fit in', is revealed in

Doyle, W. (1990). Themes in Teacher Education Research. In *Handbook of Research on Teacher Education*. R. Houston (Ed.), New York: Macmillan.

The confirming study of secondary school principals is

Stephenson, I. and Stonehouse, G. (1990). *Teachers for your school in the 1990's. How can the Auckland College of Education train them better?* Unpublished manuscript, Auckland College of Education.

The USA figure of 30% of first-year teachers not continuing to teach is from

Bullough, R.V. (1989). *First Year Teacher: A Case Study*. New York: Teachers College Press.

The research in progress on teacher's college students' views and first-year teachers' views has begun publication. It is

Renwick, M. and Vize, J. (1990, 1991, 1992). *Windows on Teacher Education*. Wellington: NZCER.

See also

Renwick, M. (1993) *Innovation in Teacher Education*, Wellington: NZCER.

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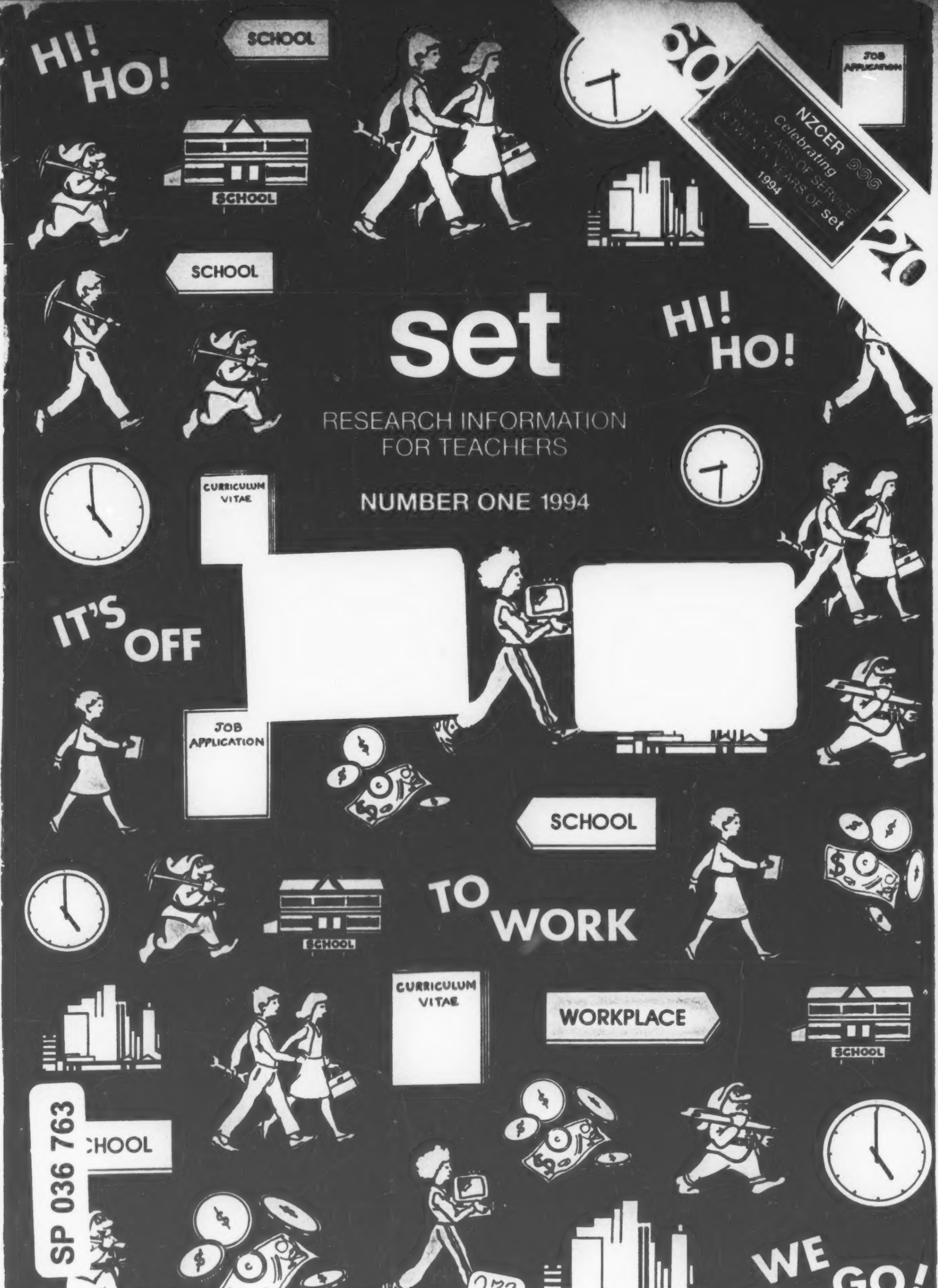
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Eve Adams

Return Addresses

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item 1

HI! HO!
set
HI! HO!
IT'S OFF
TO WORK
WE GO!

set
number one 1994

Research information for everyone interested in education: teachers, principals, students, lecturers, professional developers, actively involved parents, board members.... Leaflets and brief reports designed for reading quickly, for private study, staff-meetings, in-service courses, or small-group discussion.

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11. **A Day at the Races**
Stephen Ceci and *Jeffrey Liker*
Regular racegoers, despite some low IQ scores, use, in that real world, extremely complex multivariate reasoning to pick winners. This research into IQ, expertise, and cognitive complexity has become a classic. New, further, discoveries are promised for ***set*** No.2.

12. **Watching Oneself Teach**
Jo Haynes
A student in her final year at a College of Education reflects on a lesson she gave, taped and transcribed. A model of self-appraisal, which will also stimulate thoughts about how to teach junior mathematics.

13. **Increasing Students' Motivation to Learn**
Jennifer Archer
The extreme methods (competition and laissez faire) are examined and research results mentioned. Her own research study of what children prefer, points to a middle way, focusing children's attention on 'improvement over time'.

14. **Thinking About Thinking**
Chris Perry
Teachers can successfully encourage learners to be better thinkers. A research study of techniques for teaching metacognition (thinking about thinking) to 8-year-olds leads to conclusions about how to do it successfully.

15. **Critical Thinking**
Helga Rowe
What is **good** thinking? Creative thinking is always a pleasure. Critical thinking tends to get a bad press, but it is just as necessary. Here it is carefully analysed, and research adds insights on teaching children to think critically.

Bonus

Women's Franchise: A Short Sketch
Eve Adams
Published 101 years ago by an anonymous author, a small pamphlet extolled the virtues of votes for women. Here is the original re-written as a play for schools and any other group.

item 2

set
number one 1994

Activity, Fitness, Mental Health, and Mood

Kathryn Thirlaway and *David Benton*

EXERCISE HABITS are set in childhood – active children become active adults. Our study, carried out with adults, has implications for those involved in encouraging children to be active as adults. The public health goal for Physical Education should be to prepare children for a lifetime of physical activity.

Background

During the 1970s psychologists started to investigate the 'feel good' phenomenon that 'exercise addicts' insisted they experienced. Initially research focused on exercise as a useful adjunct in the management of the mentally ill. It was found that physical activity was associated with lower anxiety and reductions in depression. More recently, exercise has been found to be associated with better mood in the general population.

Increasing physical activity results in increased cardiovascular fitness (as measured by maximum oxygen uptake). However, few studies have considered whether better mental health reflects cardiovascular *fitness* or reflects simple participation in physical activity.

In our research we investigated this question suspecting that better mental health and mood goes with physical activity in general (for example, the activities of the usual school PE programme) rather than with full scale fitness (such as athletic training produces).

The subjects

In a local government office a staff bulletin was sent out by the personnel department offering a free fitness test, in office hours, in return for completing three questionnaires. 208 out of approximately 600 white collar workers volunteered to take part. Thirty-eight took their fitness test at a leisure centre and completed the questionnaires afterwards, the rest were tested at work. There were 155 males and 91 females, aged between 18 and 63, most being aged between 30 and 40.

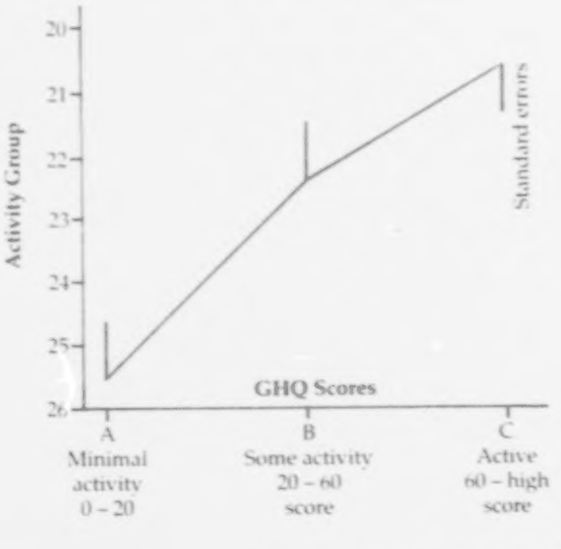
The procedure

The first questionnaire was about their activities over the last fortnight. There were activities to tick: yoga, aerobics, cycling, golf, running, swimming, table tennis, basketball, rugby, badminton, tennis, squash, cricket, wind surfing, self defence, walking, dancing, karate etc., anything else not mentioned above. They were asked the number of times in two weeks, and the average time (hours and minutes) on each occasion, and the distance covered for cycling, running, etc.

Chart 1

GHQ scores and levels of activity

A low GHQ score, e.g., 20, indicates good mental health.

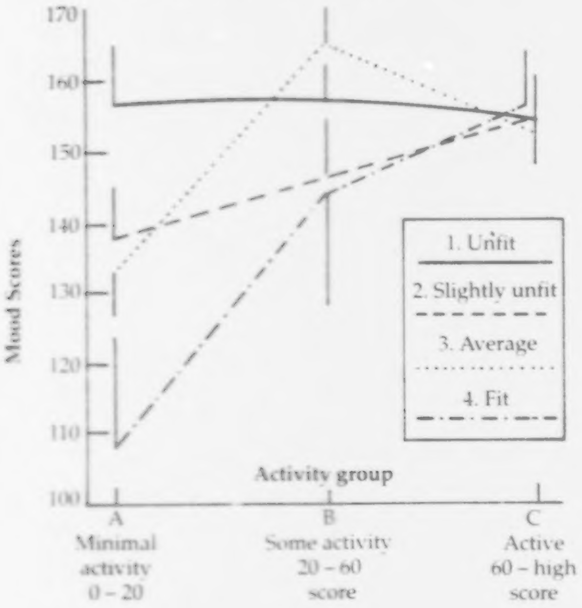


The second questionnaire was about a mood, the third about mental health. A series of physiological measures were taken in order to validate the later cardiovascular fitness test: weight, resting pulse, blood pressure, body fat and lung capacity. As long as blood pressure was normal everyone proceeded with the sub-maximal bicycle test of cardiovascular fitness.

Chart 2

The mood scores of those in four fitness groups (1 to 4) with different levels of activity (A, B and C)

A high score indicates a good mood.



Measuring cardiovascular fitness: the sub-maximal test of VO2 max.

A sub-maximal measure of VO2 max is based on the high correlation between cardiac output during exercise and oxygen uptake. If everyone does the same amount of work they will use (almost) the same amount of oxygen. But the fit need fewer heart beats to do it – their pulse rate, on average is, slower. So the test was a special ergometric ('exercycle') bicycle. Each person did 6 minutes at 50 pedal turns per minute and the average heart rate over the last 2 minutes was recorded. Maximal oxygen uptake per litre was predicted, that figure corrected for age, and converted to oxygen uptake per kilogram of body weight per minute. The data allowed us to put everyone into four fitness groups depending on their sex and age:

Group 1	Low
Group 2	Somewhat low
Group 3	Average
Group 4	High

Measuring physical activity

Using the questionnaire on physical activity over the last fortnight each type of exercise was assigned a value that reflected the amount of oxygen consumed by the body per minute. The total time spent in a fortnight on each activity was multiplied by its value per minute and the scores for each activity performed were added to give a total. We then had three groups according to their activity score:

Group A	Minimal activity	0 – 20
Group B	Some activity	20 – 60
Group C	Active	60 – high

To score 0 you had to report no physical activity at all. To score 20 points in a fortnight you would have, for example, walked for 20 minutes every day or swum for 20 minutes twice in a fortnight. To score 60 points you may have walked for 70 minutes daily or swum for 30 minutes 8 times in a fortnight. Most people gathered points from a range of activities.

Physiological measurements

Blood pressure and *pulse* were measured using a Philips electronic blood pressure meter after the subjects had spent five minutes quietly completing questionnaires.

Lung capacity was measured using a pocket spirometer. Forced Expiatory Volume per second was measured 3 times and the maximum value selected.

Body fat was assessed from skin fold measurements. Four measurements were taken: biceps, triceps, sub scapular and supra-liliac. The sum of these four measurements result in an estimated fat content which was expressed as a percentage of body weight, dependent on sex and age.

Measurement of mood

The Profile of Mood States (POMS) was used to assess mood state. This popular method of mood assessment consists of 65 adjectives which subjects rate on a five point scale from 'not at all' to 'extremely'. It is the most consistently used and well reviewed mood questionnaire.

Measurement of mental health

Every subject completed the 30 item version of the General Health Questionnaire (GHQ). The questionnaire was scored using the Likert method. For each of 30 states a subject must circle one of 4 possible responses. For example:

Have you recently been able to concentrate on whatever you're doing?

Better than usual	Same as usual	Less than usual	Much less than usual

Have you recently been feeling hopeful about your own future?

More so than usual	About same as usual	Less so than usual	Much less than usual

Statistics and Validity

The data were analysed using the SPSS/PC statistical package. A preliminary analysis showed that age was not a relevant variable. Fitness scores (Estimated VO2 max) correlated positively with diastolic blood pressure, systolic blood pressure, resting pulse, weight and lung capacity. This confirms that the measure of cardiovascular fitness is a valid one.

Activity scores correlated positively with cardiovascular fitness (VO2 max) and with pulse but not with blood pressure, weight or lung capacity. This suggests that our measure of physical activity is also a fair estimate of cardiovascular fitness although not as accurate as the sub-maximal VO2 test. You would expect cardiovascular fitness to be associated with activity; physical activity is a large factor in determining cardiovascular fitness. The correlations between the questionnaire measure of physical activity, cardiovascular fitness and pulse allow us to be confident that our measurement of physical activity is valid.

Table 1

Correlations between activity scores, fitness scores and the physiological measures

	Activity Scores	Fitness Scores
Activity scores	–	Yes
Fitness scores	Yes	–
Diastolic blood pressure	No	Yes
Systolic blood pressure	No	Yes
Resting pulse	Yes	Yes
Weight	No	Yes
Lung capacity	No	Yes

Mental health

Those people who had lower GHQ scores reported higher levels of activity, regardless of sex, age or fitness (Chart 1). A low GHQ score indicates good mental health. Active people may report better mental health *either* because physical activity improves mental health *or* because those in good mental health are more likely to be physically active. As a number of intervention studies have found that introducing physical activity is associated with improved psychological functioning, there is good support for the first explanation.

Age

Previous studies have found that the association between better mental health and physical activity was stronger in older people. Only 23 of our group were over 50, so there may not have been enough older people to demonstrate the phenomenon conclusively.

Sex

We, and others, have made studies which included men and women from various occupations (including housewives) and usually women have a clearer link between mental health and physical activity. In this study all the men and women were civil servants working under similar conditions and there was no difference between the sexes. It may be that women of lower occupational status have poorer mental health, generally.

Mood

For everyone except those classified as unfit (Group 1) increasing activity was associated with improved mood (Chart 2). In those people who are inactive, increasing fitness is associated with lower mood scores. Possibly when you exercise beyond the limits of your physical fitness the positive response to activity is counteracted by detrimental effects of over-exertion. If this is the case, whether or not a fitness programme is too demanding to benefit mental health will depend on the fitness of the individual. The present study shows clearly that the mood of subjects in the lowest fitness category does not improve with increasing activity, suggesting that activity is beyond their physical limits.

The addictive nature of physical activity

The stress associated with over-vigorous exercise cannot explain why the inactive and unfit are in as good a mood as those who are fit and taking more activity. Subjects who are inactive and fit have a poorer mood than those who are inactive and unfit (Chart 2). Possibly, those who were fit but inactive were physically active until recently when some external factor such as injury or work commitments prevented them maintaining their usual level of activity. A number of subjects did comment that they were unable to exercise as much as they liked for a variety of reasons. It seems that stopping exercising, when you are in the habit of exercising may be stressful and depressing.

The present research suggests that exercise does not result in improved mood. Rather a given level of fitness requires a given level of activity, and failure to achieve this level of activity is associated with a poorer mood. In other words, exercise at whatever intensity may be addictive. The addictive nature of regular physical activity has been referred to as 'positive addiction', however, the alternative term 'habituation' is more accurate and less confusing. The term 'addiction' is best used to refer to those few people for whom the compulsion to exercise interferes with other aspects of their lives. Despite the habitual nature of exercise, the majority of the adult population do not participate in enough exercise to maintain even minimum fitness.

Fitness or activity?

The high correlation between fitness and physical activity (Table 1) suggests that the method of assessing physical activity used in this study is also a good measure of cardiovascular fitness. Despite this, activity is associated with mental health and fitness is not. Similarly, activity is associated with mood, fitness only qualifies the association between mood and activity.

Mechanisms

There is much controversy over the mechanisms that bring about the association between physical activity, mental health and mood. Psycho-social mechanisms have been suggested – performing physical activity may result in a sense of mastery and increased self-esteem and this will be reflected in better mental health and mood. Those who find the activity beyond their physical limits due to lack of fitness would not gain in self-esteem. However, a physiological explanation, such as the release of endorphins or monoamines in the brain cannot be discounted.

Conclusions

As we had thought, there is little positive association between actual fitness and mood and mental health. This has implications for how we prescribe physical activity. The emphasis needs to be on performing physical activity rather than on improving fitness. It appears that the greatest *psychological* benefits accrue to those who exercise moderately.

It has also been suggested that the greatest *physical* benefits accrue also to those who exercise moderately. La Porte and colleagues argue that health benefits arise from increased physical activity rather than greater fitness. Leon et al. say that moderate physical activity is associated with reduced coronary troubles and death, but high levels of exercise confer no additional benefits. Shaper and Wannamethee report (having followed 7735 men for 8 years) that the risk of heart attack decreases significantly with increasing physical activity; however, vigorously active men have higher rates of heart attack than moderately active men.

Keeping up any programme of exercise is a major problem and many workers have found that the higher the intensity of exercise you aim at the harder it is for you to keep the programme going. The emphasis of any programme encouraging physical activity should be moderate activity. That will bring about the improvements in psychological and physical health we all want, and be easy to maintain.

This study, although about adults, has implications for those involved in encouraging children to be active. Most adults are inactive and find it difficult to maintain an exercise programme. Exercise habits are set in childhood; active children become active adults. The public health goal for Physical Education should be to prepare children for a lifetime of physical activity.

It has frequently been suggested that 'lifestyle activities' that have the potential to continue into adulthood should be introduced into school Physical Education programmes. So far it is unclear what 'lifestyle activities' are and there is little evidence to show which activities 'carry over' into adulthood. Perhaps the emphasis of physical education should be on as many students as possible enjoying themselves while taking some form of exercise, be it traditional team games or high energy aerobics. If we can encourage enjoyment of physical activity in children they have more chance of remaining active as adults, with the benefits of both better physical health and better mental health.

Notes

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Dr David Benton is a Senior Lecturer and Research Fellow in the Psychology Department, University College of Swansea, Singleton Park, Swansea, West Glamorgan, United Kingdom.

Active children become active adults

As examples of research demonstrating this, see

Blair, S.N., Clark, D.G., Cureton, K.J. & Powell, K.E. (1989) Exercise and fitness in childhood: implications for a lifetime of health. In, *Perspectives in Exercise Science and Sports Medicine. Volume 2: Youth, Exercise and Sport.* (Eds, Gisolfi, C.V. Lamb, D.R.). Indiana: Benchmark Press.

and

Sallis, J.F. and McKenzie, T.L. (1991) Physical education's role in public health. *Research Quarterly for Exercise and Sport.* No. 62, pp.124-137.

Background

For research on exercise and the mentally ill see, for example

Klein, M.H., Greist, J.H., Gurman A.S., Neimeyer, R.A., Lesser, D.P., Bushnell, N.J. and Smith, R.E. (1985) A comparative outcome study of group psychotherapy vs exercise treatments for depression. *International Journal of Mental Health.* Vol. 13, pp. 148-177.

For the reduction of depression with physical exercise see, for example

Fasting, K. and Gronningsaeter, H. (1986) Unemployment, trait anxiety and physical exercise. *Scandinavian Journal of Sports Science.* Vol 8, pp. 99-103

and in the general population

Simons, C.W. and Birkimer, J.C. (1988) An exploration of factors predicting the effects of aerobic conditioning on mood state. *Journal of Psychosomatic Research.* Vol. 32, pp. 63-75.

That equal work uses equal oxygen and how to measure the factors in this section see

Astrand, P. and Rodahl, K. (1986) *Textbook of Work Physiology: Physiological Bases of Exercise.* Singapore: McGraw-Hill.

The ergometric bicycle was a Monark-Crescent AB Varberg, Sweden. The heart rate monitor was from Triadcolour Electronics Ltd.

The values assigned to each exercise can be found in

Cooper, K.H. (1970) *The New Aerobics.* New York: Bantum Books.

These values have found related to a calculation of VO2 max, see

Roth, D.L. (1989) Acute emotional and psychophysiological effects of aerobic exercise. *Psychophysiology.* Vol. 26, pp. 593-602.

The pocket spirometer was from Micro Medical Instruments Ltd. A useful article on body fat measurement is

Durnin, J.V.G.A. and Wormesly, J. (1974) Body fat assessed from total body density and its estimation from skinfold thickness: measurements of 481 men and women aged from 16 to 72 years. *British Journal of Nutrition.* Vol. 32, pp. 77-97

Reviews of the Profile of Mood States (POMS) can be found in

McNair, D.M., Lorr, M. and Droppleman, L.F. (1971) *Manual: The Profile of Mood States.* San Diego: Educational and Industrial Testing Service.

Peason's correlations were used to correlate the physiological measures with cardiovascular fitness and activity score. Three way analysis of variance: Activity x Fitness x Sex was used to analyse mental health and mood.

As examples of the intervention studies that have shown that physical activity is associated with improved psychological functioning see (as well as those in *Background* above)

Goldwater, B.C. and Collis, M.L. (1985) Psychologic effects of cardiovascular conditioning: A controlled experiment. *Psychosomatic Medicine.* Vol. 47, pp. 174-181

and

Lichtman, S. and Poser, E.G. (1983) The effects of exercise on mood and cognitive functioning. *Journal of Psychosomatic Research.* Vol. 27, pp. 43-52.

and

Moses, J., Steptoe, A., Mathews, A. and Edwards, S. (1989) The effects of exercise training on the mental wellbeing in the normal population: A controlled trial. *Journal of Psychosomatic Research.* Vol 33, pp. 47-61.

Studies showing that women have a clearer link between exercising and mental health than men, include

Stephens, T. (1988) Physical activity and mental health in the United States and Canada: Evidence from four population surveys. *Preventative Medicine.* Vol. 17, pp. 35-47

and

Thirlaway, K.J. and Benton, D. (1992) Physical activity and its relationship to mental health – a survey of 6200 subjects.

and

D'Arcy, C. (1982) Prevalence and correlates of nonpsychotic psychiatric symptoms in the general population. *Canadian Journal of Psychiatry.* Vol. 27, pp. 316-324.

That this result may be because women have lower general mental health is discussed in

Stephens, T., above

and

Thirlaway, K.J. and Benton, D., above

Reference to 'positive addiction' is in, for example

Sachs, M.L. (1984) Psychological well-being and vigorous physical activity. In *Psychological Foundations of Sport,* edited by J.M. Silva and R.S. Weinberg. Human Kinetics.

That the majority of adults do not maintain minimum fitness is revealed in

Stephens, T., above

That moderate exercise gives the greatest psychological benefits is explained in Stephens, T. and in Moses, et al., both above.

That the greatest physical benefits also accrue is outlined in

La Porte, R.E., Adams, L.L., Savage, D.D., Brenes, G., Deerwater, S. and Cook, T. (1984) The spectrum of physical activity, cardiovascular disease and health: an epidemiological perspective. *American Journal of Epidemiology.* Vol. 120, pp. 507-517.

and

Leon, A.S., Connett, J., Jacobs, D.R. and Rauramaa, R. (1987) Leisure-time, physical activity levels and risk of coronary heart disease and death. *JAMA.* Vol. 258, pp. 2388-2395.

Heart attacks and exercise are researched in the same work.

and

Shaper, A.G. and Wannamethee, G. (1991) Physical activity and ischaemic heart disease in middle-aged British men. *British Heart Journal.* Vol. 66, pp. 384-394.

Research on keeping exercise programmes going is, for example, in

Martin, J.E. and Dubbert, P.M. (1985) Adherence to Exercise. In *Exercise and Sports Reviews,* edited by R.L. Terjung, Vol. 13. New York: Macmillan Publishing Company, 1985.

That the public health goal for Physical Education should be to prepare children for a lifetime of physical activity is the message in

Sallis, J.F. and McKenzie, T.L. (1991) Physical Education's role in public health. *Research Quarterly Exercise Sport.* Vol. 62, pp. 124-137.

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item 3

set
number one 1994

'Don't Patronise Us!'

Susan Groundwater-Smith & Kathy Forster

HERE ARE THE VOICES of women who should be heard: women with children at school, women from the bush and the suburbs, working class parents with stories of their own schooling, and fears that their children are getting a no better deal.

HERE ARE 50 WOMEN who should be heard: women with children at primary school, but women whose voices are rarely heard through parents' organisations; women whose ages range from mid-twenties to early fifties; women who live in the Australian bush, women who grew up in mining towns, women who still live in the metropolitan suburbs in which they were raised; women who have come to Australia with their families from countries as far afield as Lebanon, Malta, Chile and China. Each has her own story, her own history, but much is common to almost all. Rising out of their past came events, achievements (or lack of achievement) and recollections of teachers, some generous and caring, some capricious and cruel. There were memories of tangy bushland settings jostling with cold passages and hostile silences.

Can such a jigsaw of images be fitted together to form some kind of coherent picture which will give us insight about the education of children today? Indeed, yes. For from these accounts it has been possible to identify a series of themes which endure and have their counterparts in the schools of today.

This study was based upon a series of interviews conducted with working class mothers who lived in New South Wales in both urban and rural communities. We asked mothers to consider their own school experiences and to give us their insights into the experiences of their own school children.

Part 1. Mothers' Recollections of Their Own Schooling

Remembering the Teachers

In all of the accounts of schooling the prominent feature was the teacher. What was it that made a 'good' teacher? Was it the teacher who had high expectations, who was firm but fair? Was it the teacher who was generous and concerned? On the other hand, how were poor teachers seen? As those who failed to help, or those who punished excessively? How did teachers cope with children who had difficulty with literacy and other fundamental skills? What kind of support and assistance did they provide? Clearly some teachers were deeply concerned about the achievements of their pupils.

> *Tracey:* It was an old classroom and probably there would have been 15 students at the most and an old male teacher. He was the Principal as well as the 6th class teacher and I have a reading and writing disability so I was always a bit slower than all the other children and he was always really good with helping me and that kind of stuff.

However, such support was not common. Look what happened to Tracey later.

> *Tracey:* ... before we moved to the mountains we used to be at a school in Lalor Park down in the suburbs and there was an elderly teacher and she was totally unsupportive. She thought I was, I don't know, awful or something. ... I was sent outside all the time and I'd have to go to the hat room or something like that; rather than have to cope with me in the classroom. I was being disruptive ... She'd put me outside where she didn't have to deal with me, so that's how she coped.

Others were derided for their lack of achievement. It is not possible here to fully capture the pain which surrounded these memories. The hesitancy, the voice breaking, the nervous laugh, the loss of eye contact between the interviewer and the mother, signalling distress about events long passed.

> *Leila:* We were reading this story and she'll (the teacher) say, 'What's that word?' and I'd get so far, you know and she'll say, 'What's that word? Come on you know it.' And she used to stand there and pinch me. Up around here, on my leg. You know that? (Laughs.) I said, 'I don't know' and you used to end up howling because you didn't know it. You know that was embarrassing because the other kids'd make fun of you.

Teachers' control over children's school lives was exercised with a mix of forbearance and oppression. While some teachers recognised the pressures and stresses faced by their young pupils, others appeared insensitive, even unconcerned. Eating, going to the toilet, talking, all were strictly controlled by the teachers. Some were judicious in their exercise of power, but others were seen as arbitrary and authoritarian.

> *Kerry:* Probably the only thing I ever really remember about Primary School is my favourite teacher hitting me

> on the back of the hand with a ruler... I was just devastated, yes. I still don't like him....

For some mothers the experience had been one of indifference, shading into neglect.

> *Joanne:* One teacher... I think I was in 5th class or 6th class and when he actually wrote my report out, he put the incorrect name on my report. That's how close he was to knowing his students. He even managed to put the incorrect name on my report!

Children resent teachers who forget their names. And some teachers used offensive nicknames, mocked them when they had difficulty with work and reprimanded them unfairly. But it is the teachers who simply don't care who were seen to be the most reprehensible. *Koori* is the name Aboriginal people in NSW use to describe themselves. Agnes is one of these.

> *Agnes:* But we had a teacher before who really didn't care. He was nearly at that age where he was ready to finish up, retire and that's all he cared about. You know, he didn't care how the school was run or whether we were getting an education or not.

> *Leila:* They (the teachers) used to say, 'Oh you can do better than that.' But they didn't help you to do better.

Some teachers were remembered with affection, not for their academic support, but for being warm, and kindly and showing a 'human' face.

> *Margie:* The headmaster was lovely. He was a lovely man; really sort of old and friendly and very nice. If you were ever sick he'd take you up and put classical music on for you while you were laying down and... yeah, really nice.

Recollecting the Curriculum

Memories of teachers were interlaced with memories of what was taught. While a number of mothers made very general reference to curriculum and achievement, specific, positive experiences were few. Those that were reported were of a social kind relating to play and sport.

> *Lindy:* I was more for sport. I never used to concentrate a lot on my school work. I did it only because of the fact that Mum and Dad used to say, 'Right you don't go out and play until your school work's done' and I'd rush and get it done or I'd leave it till the next day before I went to school. Knew I had to do things like that. But I was, you know, never one for school. I would have preferred to be out with my sport.

Negative experiences of the curriculum were to do with poor achievement and low expectations.

> *Jacki:* ... I couldn't understand what was going on and no-one seemed to think that it mattered either. You know, I mean obviously they weren't very impressed because my report against every subject they put things like, 'Could do better if she tried.' Or I remember my mother coming to school and me interpreting what the teacher was saying and, foolishly, I just said, 'He said I could do better if I tried.' And that ensured a belting when I got home and certain things like that.... You know now I look, it was just absurd that they allowed me just to sit around for all those years. You know we would have sort of to 'write a story' and I would start with a blank page and finish the lesson with a blank page and no-one would say a word to me and I got away with that for years.... The system let me down. What did they think I was doing when I was just sitting there class after class, handing in blank pieces of paper and, you know, how dare they allow that to happen....

Clearly the mothers remembered the experienced curriculum. This was not necessarily the curriculum planned and intended by the school. Many of the enduring memories were of events and interactions which served to remind mothers of their lack of status and power in relations with teachers and with peers.

> *Tracey:* I spent a lot of my schooling time out in the corridor... out in the corridor wondering what it was all about...

> *Sue:* I remember being put into the play... and I was one of the ugly sisters in Cinderella. Feeling bloody ugly too... I was rather fat. Ha, ha, with all the freckles I had I probably did look like an ugly sister. Looking down on all the parents and everyone there I froze. I couldn't remember the lines, you know — what I had to say. I just froze. And then I was told off for not remembering the lines and I thought, well, 'Block the rest of that out.' And I don't remember too much about it.

But these matters are not easily forgotten. Sue's memories were highly specific. Lindy, on the other hand remembers a more general dislike of the school and its curriculum.

> *Lindy:* I was at the school a few years, going to the Canteen and things like that with Mum and knew the school environment and all that around me and it just never ever interested me. And the day I went (starting school) I know I cried and cried, and for the first couple of weeks I used to beat Mum home from school.

As children, mothers came in a variety of shapes and sizes. Their social relations were governed by how they looked and the manner in which they behaved. Interactions with peers formed an important part of what they found at school, the *experienced* curriculum.

> *Jenny:* I wore glasses at that time (in primary school) and they used to call me names.

> "...'What's that word? Come on, you know it!' And she used to stand there and pinch me, up round here, on my leg."

> *Leila (Koori):* We were the only Koori kids in the school... Ah you felt sort of left out because you didn't have any of your own there. You know, your own relatives. We were the only black kids in the school... The kids called you black and you sat over there in the corner. It made you feel ashamed.... You felt like hiding because you were black and they made fun of you... Because you were black you weren't encouraged to learn your lingo and now I'm older it's sad because I don't know our lingo. My grandmother used to speak it up there. I remember her talking it to these other old people there you know. They was made to feel embarrassed if they talked it in front of, spoke their language in front of white people, so they carried that over to us you know.

Some mothers believed, retrospectively, that they should have been more responsive and in control.

> *Tracey:* I wouldn't say I have pain about school. I have more, oh I don't know what the word is, but I wish now I'd tried harder to deal with the problems that I had.

> Now as an adult. ... I wished I'd been prepared to listen to a lot of what they had to say rather than thinking, 'Oh, I know what's wrong' and (you know) I couldn't be bothered learning I guess.

Recalling the Classroom

Memories of primary school classrooms as rooms, were relatively rare. Even when prompted these mothers found little to recall about the physical environment. Some accounts, however, were infused with sensual recollections; the smells, textures, and sounds came together to portray the various environments, ranging from warm, humane, receptive places to those remarkable only for their drabness, overcrowdedness and coldness.

> *Tracey:* It was always a light and airy old classroom. Lots of old chalk dust. It was quite pleasant really. In the Blue Mountains so it was pleasant surroundings and everything. There was all that.

It is interesting that in the rich and diverse narratives it was the social which clearly overrode the material. Of the fifty women interviewed only a handful attempted to describe or reflect upon the classrooms in which they had spent many years of their lives.

School Involvement of the Mothers' Own Parents

Few others could remember their own parents being confident about making a contribution to the school, other than assisting in the canteen or fund raising. Indeed, the territories of school and home were mutually exclusive.

> *Agnes (Koori):* Oh I don't know (regarding parental involvement) because there's, you know, commitments at home, being so far out (of town), no car to get in and that sort of stuff and their lack of education too.... But people didn't worry about those things in those days, you know. You just sent your kid off to school and that was it.

But what of the expectations of parents, the pressures and demands of the family and community? When they were children what kinds of aspirations were these mothers subject to? To what extent was the powerful self-fulfilling prophecy at work? Being female restricted many.

> *Margie:* I wanted to be a social worker. I really did, but I was never encouraged. I used to talk to Mum about it but she kind of just brushed it aside I think and never thought much about it. Girls weren't intended to have careers then and I didn't get any encouragement on how to go about being a social worker. I had no idea. I mean when you're 16 you don't know unless someone says, 'Well you've got to go to Tech and do this'.

For Leila, being Aboriginal was a barrier to progress and development. When Leila was at primary school it was still possible for a school principal to exclude Aboriginal children if white parents objected to their presence in the school. Acceptance for Leila was tentative to say the least.

> *Leila:* ... you weren't allowed inside their (the white children's) house. You had to play outside. You weren't allowed inside their house. As if you would mess it up or, you know. It's OK to play outside in the paddock and in the dirt, but you weren't allowed inside their house.

For some, although the community rejected them, the family maintained their own self-esteem and sense of personal worth.

> *Jacki:* They (parents) had a positive image of themselves as hard workers. Hygienic, clean people, you know, who had spotless homes; unlike them who supposedly were morally superior; unlike their daughters who run around at 13, 14, to the movies on Saturday afternoon with boys.

The power of these accounts cannot be underestimated. The mothers' recollections convey a graphic picture of the relations between their schooling experience and the social, economic, cultural and racial dimensions of their lives. Thus we are assisted in understanding the ways in which schooling is culturally constructed. The home socialisation of children is fundamental to the ways in which they will ultimately engage with their schooling and benefit from it. In the following section we shall see how many of the mothers' encounters with schooling are being experienced by their children and how educational disadvantage is being systematically reproduced. It is our professional responsibility as teachers to be aware of the social justice implications of this reproduction and consider how this cycle of educational disadvantage can be overcome.

Part 2. Mothers' Perceptions of Their Children's Schooling

At this stage we are ready to start examining the links between the mothers' experiences of schooling and how they felt about the primary schooling of their children. The questions focused on primary schooling and asked whether they were happy with their children's schooling; whether they felt they knew what kinds of things their children were learning; whether they felt they could approach the school with a concern about their children's schooling and that something would be done about it; what they hoped their children would achieve educationally; and whether there were any other issues they wanted to talk about. The interviews were informal and open-ended and the mothers volunteered a wide range of information, so a wide range of issues and concerns emerged.

Once the interview turned to the schooling of their children, the mothers readily described how well their children were progressing at school. It was noteworthy that the majority of the mothers had a child who was experiencing some difficulties with school work. These were most commonly described as difficulties with reading and/or writing (including spelling) and, to a lesser extent, with mathematics. Difficulties were most frequently reported by the socially disadvantaged Anglo-Australian mothers and the Aboriginal mothers, but were also described by some of the mothers of non-English-speaking background.

Mothers' Responses to Children's Difficulties – Help at Home

In the interviews the mothers spent a great deal of time describing how they responded, both at home and at school, to the difficulties their children were experiencing. Helping the child with homework, reading with the child, and arranging tutoring were the most commonly reported strategies at home. But those strategies which involved the mother personally helping the child presented a problem for mothers who were semi-literate or were barely able to read English. In these cases the mother often made efforts to find someone else who could help the child, such as a relative or older sibling. In a couple of striking cases the mother went back to school herself to learn how to read, to be able to help her child.

> *Rhonda:* Yeah, I go two nights a week down at TAFE Petersham. I'm going really well... It's still very hard for me but I think back and knowing that I've got to learn to do it now for Rachel and Guy and I think of all the time what the schools and the education done for me. Ruined my life because of it, where they were too lazy to spend a bit of time with me.

In this comment Rhonda shows that a significant part of her motivation comes from a concern to be able to help her children but she also gives the impression that part of her determination to learn to read now is related to a sense of profound injustice perpetrated upon her by the schools and teachers who failed her as a child.

Other attempts to help show a strong emphasis upon noting and supervising homework. The difficulties the single mothers had in finding time to give as much assistance as they would have liked to give (*and* felt qualified to give) emerged strongly.

> *Debbie:* Because [Jodie's] not interested in any of her work and I've, you know, even tried to sit her down and say, 'What did you do at school?' and she always comes home and says, 'Nothing, not much, nothing much.' And I'm trying to find out, you know, what she learnt today so I could give her extra work. But whatever she learnt didn't really sink in...
>
> By me being a single parent, there's only me, um, my daughter and I sort of do fight a little bit. And I can't say things like, 'Wait till your father comes home' and it's only me and her, so... I find it very hard trying to give her work and it starts stressing me up so in the end I sort of give up cause I don't want the arguments and I don't want her to hate me.

The interviews with the mothers for whom English was a second language reflect their awareness of and concern over their own limitations:

> *Interviewer:* So can you help the girls? Have you been able to help the girls with their homework?
>
> *Mary:* No, I didn't help them, they teach themself... Yeah, no. The big one she's teaching her sister.

Mothers' Responses to Children's Difficulties – Interacting with the School

Most of those mothers whose child had a problem had discussed it with the school; usually with their child's teacher and sometimes with the Principal or a school counsellor. In quite a large number of cases the mothers had approached the school first. Sometimes the school took the initiative in relation to the child's problem, suggesting a strategy to the mother, such as reading to the child at home or having the child repeat a grade or receive some special tuition such as in a special class.

> *Interviewer:* So how did you become aware that your son was a little bit behind in the work?
>
> *Jenny:* The teachers.
>
> *Interviewer:* They told you?
>
> *Jenny:* Yes, oh yes. You'd go down there and he'd say Nathan just can't get the grasp of reading or he can't get the grasp of writing anything and things like that. If that is because the class is too big and the teacher hasn't got time, I don't know but most of the kids are five and a half when they go to school, well both my boys went to school at four and nine months.... Well they suggested, she said to me, 'Would you contemplate letting Nathan repeat?' and I said 'Absolutely.' I said, 'I feel really good about that if that's the right thing to do. I can do all this extra work with him at home and see how he goes.' And I have done that over the year, but it is difficult to find a lot of time extra, you know, a lot of time with the other kids.

Sometimes the school's response was much less helpful, in the mother's eyes at least:

> *Gillian:* Well I went down for an interview last week with the Principal and well, at the beginning of the year they had too many children in the first class so they wanted to take the four youngest children and put them back in kindergarten and they told me it would be a combined kinder/first class. When I went down for the interview they said it was all kinder. I never heard anything at all about first class and I waited until after it was finished and went and confronted the teacher and I said 'Are they doing first class work or are they doing kindergarten work?' And she said, 'Well they're doing kindergarten work'. Well that wasn't good enough. I went and saw the Principal and I had all the other mothers up in-arms because they were supposed to be doing first class work and they weren't, they were doing kindergarten work. And they had put them back there because they said there were too many children in first class. The day after I complained those four children went back to first class, yet they said there wasn't enough room...

Gillian clearly recognised that her child had a problem but she resented the seemingly off-handed and perfunctory way that the school was addressing that problem. This episode says as much about poor communication between the school and the mother as it says about the school's response to the child's difficulties, but the impression left with the mother is that the school's treatment of the child does not reflect a close and careful analysis of the child's difficulties at all, nor does the school put what is best for the child ahead of its own organisational convenience.

In some cases the mother went to quite a lot of trouble to address a problem which, while it received a co-operative response from the school once she had identified it, required the mother to take the initiative first of all. Jackie described how her daughter, in second class, became aware that all the other children could read but she could not.

> *Jackie:* ... They were bringing home little readers from school... and I'd try to sit down and get her to read it and she just couldn't read it and she said to me, 'Mum, how come I can't read?' you know, and I said, 'Well I'm not sure, we might have to go and see the school counsellor and just, you know, find out why.'

Jackie took her child to visit the school counsellor and to have an eye test at the school too. When the eye test did not show anything she took her child to an optometrist, who did identify a problem with the child's vision and indicated that the child should be sitting near the front of the classroom. The teacher accordingly moved the child to the front of the room. In addition, the school counsellor arranged a reading programme for Jackie to follow at home with her daughter. The school was certainly co-operative and helpful but it was the mother who took the initiative and found the cause of her daughter's inability to read. This was by no means an isolated episode.

All the mothers expressed concerns about the schooling of their children, concerns which had clearly been thought about over a period of time. In other words, none were fully satisfied with what the schools were achieving for their children, even if they did not always have the confidence to express these reservations.

Mothers' Aspirations for Their Children

Most of the mothers in the study indicated that they had high aspirations for their children in that they hoped they would do well at school and be successful after school. Only one or two mothers indicated that doing well at school and being successful in life were unimportant in their scale of values. The mothers from non-English-speaking backgrounds all hoped that their children would go on to university and enter high status occupations. The Anglo-Australians were more equivocal. While they hoped that their children would 'do well' it was 'up to them'.

> *Marion:* I'd like them to do well but that's up to them. Once they get to a certain age, you know, doesn't matter what you say or do, they are going to do what they want to do. I'd just like them to do well and go as far as they can.

Marion feels that she should not 'push' her children even though she now feels that she may have benefited educationally from more pressure from her own parents. It may be that there is a cultural norm operating here; the Anglo-Australian mothers commonly made reference to their children 'doing their best' and going as far as their ability would take them – they assumed that the ability of their child was more or less fixed.

At times this assumption of fixed ability is augmented by an actual *preference* that the child not achieve anything outstanding at school.

> *Dagmar:* I don't know. I don't. I would just hope that they go through school without any hassles or anything. I don't want them to be below average and I don't want 'em to be brainy or excel but I'd like it if they floated along like they are now and I don't expect anything great from them. I really hope that they enjoy it and get through and learn, not be intimidated, like primary school was for me.

Many mothers from non-English-speaking backgrounds said their children might not be able to (nor want to) go on to tertiary education and acquire professional qualifications. However, they were much firmer that this is what they were *hoping* their children would do. The naivety and ambivalence of the Anglo-Australian mothers is shared by the three Aboriginal mothers.

> *Agnes:* I'd like them to get a good education. Um... if they want to leave at form four, they can leave at form four, I'm not going to push them. As long as if they leave at form four that they'll either go on to do a good course or get a good job, that's all I worry about. And as Tod said, he's going to be the first Aboriginal to fly a Qantas plane... Hah, hah. Well, that's what he's got in his head. Emma wants to be a nurse, she loves that medical area. Or now that I'm into teaching she's even thinking about teaching. She says, 'Mum I might even open up my own Aboriginal school or something, I don't know.'

Mothers' Knowledge about their Children's Schooling

The mothers were asked how much they felt they knew about their children's schooling and how much impact they felt they could have on it. Those who were disaffected with the school said they felt they really knew little about the kind of education their children were receiving. Others felt that they knew enough from questioning their children or inspecting their homework. Some of the mothers whose first language was not English (who were able to be interviewed only with the help of an interpreter) had not been able to acquire even such basic information as the name of their child's teacher:

> *Interviewer:* So do you know Wali's teacher?
>
> *Fatima:* No.
>
> *Interviewer:* Is it a man or a woman?
>
> *Fatima:* I don't know. Maybe man. Lady.
>
> *Interviewer:* It's a lady? Right. So you haven't gone to talk to her.
>
> *Fatima:* No.
>
> *Interviewer:* No. Do you think that if she did she would help you or do you think she would say, 'Oh, nothing we can do'?
>
> *Fatima (child speaking for her):* She goes, maybe she'll understand.

In Fatima's case, the problem under discussion was with her son, whom the school was proposing to send to a special school because of learning and behavioural problems. An interpreter had informed Fatima about this but she had had no direct contact with any of the teaching staff about this issue at all. Some of her helplessness is conveyed by the following comment:

> *Interpreter:* ... every morning when they go to school she talks to them not to get into trouble (you know) do anything wrong. And she always tells them that (you know). Tells them not to do all that silly stuff. She tells them not to do anything wrong. And after they say, 'We don't like school, we don't like the teachers.'

“...A good teacher is one who cares.”

On the other hand, some of the mothers appeared to know quite a lot about what their children were learning and how they were being taught. This was clearly related about the extent to which they were actively *involved* in the school. In particular, those rural Anglo-Australian mothers who were connected with a small school appeared to be very active in the school, to know quite a lot about the school's activities and to have the most favourable attitudes to the school.

> *Tracey:* Yes, our school is really good. We have a reading programme that the teacher set up. I think three days a week, one of the mums comes in sits with the kids and have reading and then I go in Tuesday afternoons for gross motor and then on Wednesday afternoons there's another mother comes in for craft and Friday there's another mother goes in for craft and then sport in the afternoon. So basically there's mothers and fathers in and out of the school all the time, which is good, which I find is really good.

This observation is all the more interesting since Tracey has considerable reading and writing disabilities herself and feels quite unable to assist her child in these areas. She says she 'spent quite a lot of my schooling time out in the corridor'. It would have been easy for such a mother to be (and feel) alienated from her child's school.

Almost half the mothers reported being involved in their children's school in some way, whether through helping in the classroom, fund-raising or attending functions in Education Week. Several of them noted that this was very different from their own parents, who never looked to be involved. All the groups had parents involved at school but it was less frequent among the mothers from non-English-speaking backgrounds.

It would be a mistake to suggest that those mothers who were not active in their children's school were not involved in their children's education. A number felt unable to help at school or indeed to help their children with their schoolwork at home, but all of the mothers revealed a keen concern with their children's schooling and, in that sense, all of them can be described as 'involved'. Not all the involvement with school was happy. For example,

> *Miriam:* The other thing that is really bothering me now is that they want these mothers to go and help them with the reading, but they want them at the teachers' convenience. For example, I go on a Tuesday at twenty past eleven she wants me to be there. Well, to me that is so inconvenient because I take Brendan down to school at a quarter past nine. I have to come back home and go back down at quarter past eleven and go back home and go back down at quarter past three. Or else, if he's [i.e. her younger child] asleep, I have to wake him up because that's usually the time he's asleep but if you don't go, like they make you feel you're really slack, as if you're not trying to help.

The involvement is often very much on the teacher's terms and attempts to have some input were not welcome.

> *Debbie:* Because I was trying to put in my point and also trying to let her know. Well, she done computers. I used to teach children computers and when I was trying to tell the teacher what she's doing with the computers isn't interesting for the kids, (they were getting bored - like you've got to give kids interesting things to keep 'em interested) she didn't want to know. ... It wasn't directly (you know) said to me, but I can feel when somebody looks at me in a different way.

Debbie felt that the reason why the teacher did not want to listen to her was because she was 'a young single mum'.

The picture that emerges at this stage is that many of these mothers were struggling to address the problems that they perceived their children as having. Some felt able to help them with their schoolwork. Most made contact with their child's school and for some this was a more satisfying experience than for others. Their aspirations for their children varied considerably, with the Anglo-Australian mothers showing some ambivalence as to how far they wanted their children to go at school. Those who were actively involved in their children's school seemed to know more about what kind of education they were receiving and quite a large number of them were involved in one way or another. Not all of them had happy experiences with their involvement. But *all* of them spoke with great feeling about their children's education.

Today's Teachers

Was there an overall view of teachers which emerged from the group? The answer is 'No'. But it was clear that very few had a completely positive view. A number said that sometimes teachers 'need a shake-up' and noted how important the Principal is in bringing this about. Three mothers raised the problems caused by their child's teacher being frequently absent from the classroom. In each case the teacher was a teaching principal or deputy principal and the mothers felt that their children's schooling had suffered as a result.

Nearly all of these comments about teachers came from the Anglo-Australian mothers. Few overall comments, either positive or negative, were offered by others. About a third of the mothers from non-English-speaking backgrounds had the attitude that 'the teacher knows best', even though, at the same time, they expressed a wish for more homework and stricter discipline in the school.

Nearly half of the group expressed opinions about what makes a good teacher. There was a surprising unanimity about it. *A good teacher is one who cares.* Quite a number of the mothers indicated that this entailed a considerable degree of firmness with the children.

> *Lindy:* He was very firm with us *and I think that's what the kids need these days at school.*
>
> *Ann S:* But they should also *have a bit of respect for the kids as well.*
>
> *Debbie:* They should be *interested in the kids.*
>
> *Dagmar:* They should *just stay more human and put themselves on a level with the kids, not to talk down, that's the biggest thing.*
>
> *Nara:* They should have *more heart for the kids.*
>
> *Leila:* They should be *more compassionate with the children* But they should also set high standards for them.

But the last word on this subject should go to Jill, who made this impassioned plea to all prospective teachers:

> ... and I would like to say to the kids who are contemplating teaching, is this really what you want to do? Do you realise that our children's attitudes and education, that are going to shape the future, are going to shape how you live your life when you're old and *your* children are going to school? Do you realise that you're going to put that into our children now? And if you're not prepared to do it properly and with enthusiasm and imagination, well then don't, because by having that attitude – I've got nothing else to do, I might as well be a teacher – that's all you're going to bring on to the children.

What emerges from these concerns is

1. a need for effective communication and information at the outset;
2. attention to the interpersonal relationships between mothers like these and the teachers of their children; and
3. some serious attention to the practical meaning of the notion of parent partnership.

We hope that this edited account, drawn from the tens of thousands of words in our interview transcripts, will act as a touchstone for classroom practitioners. You may wish to ask yourself, 'If I interviewed the mothers of the children in my class today what stories might they have to tell?'

Notes

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item 4

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The too hard basket?

CLOSING THE GAP BETWEEN PARENTS AND TEACHERS

Cathy Wylie

JUST after I finished writing the final report of a study following 32 children through their first three years of school, I was trying to tell a friend who had a six year old child, and another who had just passed out of the junior school, what we had found. It seemed to the teachers, I said, that where as they saw a spiral or zig-zag process of learning in the classroom most parents had a linear, arrow-like view of progress.

'Okay', she said. 'But I've just found out that Lucy can't read! And not because the school told me. I had to find out myself. Yet she's had all these glowing reports about how well she's doing, what a joy she is to have in the class. I mean – what's the point of that if she can't read? If she's behind others the same age?'

I outlined some of the research findings on how learning can be undermined by summative assessment, streaming, and continual grading of children relative to each other. 'You're probably right', she said, 'but that's not what counts.' In the workaday world, where only one person can get the job, comparative ranking seemed much more important.

Then we talked about what action she had taken. Every day during the school holidays she worked on her child's letter and word recognition. She spoke to the teacher, who promised that her child could do the Reading Recovery programme. The tag 'recovery' was unwelcome, but she felt some intensive effort was necessary at this vital stage of her child's learning. She was further upset when she learnt (from parents) of several other bright, assertive children who had also 'ended up' in Reading Recovery. Yet she was careful in her communication with the teacher, and unwilling to complain to the principal. She did not want her children to suffer any resentment which a complaint might cause.

I was saddened by her tale. I wondered if she would have been so sceptical about diagnostic approaches to learning and assessment if there had been closer, more informative communication from teacher to home. She needed specific information on the child's progress, but also about the classroom programme, and the signs of growing understanding and skill, especially those which parents can see (and help build).

And the power of the teacher this story reveals! When teachers discussed what helped, or hindered children's progress they kept coming up with a picture of the *well-meaning but undermining parent*. What a contrast!

Why is it that parents and teachers can have such different perceptions of the teacher's role, and of what is important or useful in children's learning? We have some useful insights to offer from interviews with the 62 teachers and 32 parents of the study children during their first three years of school. From this study came some ways in which the differences in perceptions could be bridged, for the benefit of child, teacher, and parent.

From the Research

Parents' understanding of what their children are doing at school, and the meaning of those activities, comes mainly from:

- what comes home with the child (talk, homework, reports);
- parents' experience of the child's classroom and teacher (mainly meet-the-teacher sessions and informal contact at the classroom door);
- comparison with other children – in other schools, or older siblings – or the parent's own memories of schooling;
- mass media descriptions and evaluations of curriculum, assessment, and standards.

How reliable and useful is this information? Media treatment of education would need another article on its own! It can be helpful; it can also be piecemeal, imbued with editors' and reporters' own lack of expertise, or coloured with preconceptions and the need for a 'good story'.

Children themselves are frustrating sources of information about the school day! We should not be too surprised. For they are actors in it, not observers. Parents learn of the unusual rather than usual, and about play (friendships) more than about work. They hear about 'ability groups' when children move in or out of them.

> You've got to really prompt him to find out what he did during the day. Unless there's something that really sticks in his mind – like the fire engine came today.
>
> If I make a wrong assumption about a group he'll correct me, whether his best friend is in it, say. It's background information for him.
>
> Often she can't tell you what you want to know. She talks about what the teacher says, exciting things, new subjects, themes, when she recognized that numbers were following a pattern, books she's read, songs they're singing.

What comes home

Parents' most regular source of knowledge about their child's progress is what comes home in the schoolbag. It was rare for the children in our study to bring home anything but reading books in the first year. These were joined by phonics or spelling words in the second year; one teacher who thought spelling homework made no difference to the children's advance sent it, simply to satisfy parents' faith in homework. Some sums and project work came home in the third year.

The emphasis on reading in children's homework in the initial school years reflects its prominence in the junior school curriculum. But it also reflects the activity-based approach to mathematics in the widespread (NZ) *Beginning School Mathematics* material, which means that there is not a lot of maths written down in the first years.

Teachers were often ambivalent about sending writing work home, until it had been 'published', that is, polished and perhaps printed out. Their emphasis on *process writing* does not meet some parents' expectations that correct spelling should come before the writing of narrative; this explains some of the ambivalence. They also wanted to have previous work of the children available at school as a resource against which to assess progress and diagnose continuing needs.

But the underlying reason for so little homework in the junior schools was that teachers felt that children should not be worked too hard – or in ways which might undermine the learning process in their classrooms.

> I discourage teaching at home. They're only six and seven, and we work very hard. If they are really slipping – and none of them are, apart from a little girl in maths – I wouldn't necessarily get back to the parents because it is an added pressure and worry on the children, and could end up in a real mess.
>
> What I'm aiming for is that they love reading. If they don't get it all right, it doesn't matter. But some parents think it's cheating if they tell the word from the picture, and they cover up the picture. You have to educate parents. Too many children get put off from that – it can be dangerous if they're told they're no good.

Homework

Homework crosses the two worlds that each child lives in: home, and school. It blurs the boundaries. But by the same token it is also an important part of informing parents of their child's progress, and of the kind of work which is done in the classroom.

> It's a bit early to say yet how he's doing. He's progressing in the books he reads, but I'm not sure about maths, because it's done at school.
>
> We can see how she's going by the ticks in her book.

Reports

What about school reports? Parents did not often mention these as sources of information or say much about them (other than that they received them). In one sense, they were taken for granted. However, the main themes amongst those who commented were that end-of-year reports were frustrating – since it was too late to act on any information they contained, or to contact the child's teacher (usually changing next year as well) – and that it was helpful to have information on the child's social behaviour. Only one of our ten study schools sent reports home mid-year to parents of second year children, and only three to parents of third year children.

All the school reports bar one (in the third year of school) reported children's progress individually, in relation to curriculum tasks or goals. Some were more specific than others. Two parents, harking back to their own school days, desired a more comparative form of reporting.

Given the amount of time teachers spend on school reports, and the black cloud that working on reports wraps around the end of the school year, their low profile with parents raises some questions about their usefulness. Perhaps other channels are needed to encourage parents' attention to, and support for, their children's learning.

Parents at school

Most of the parents had been into their child's classroom at some time in all three years of school, though not on a regular basis, particularly as the child grew older, and often not for very long. Those who had were usually appreciative of the changes since their own school days.

> I was brought up under 'you do this right, if you don't, you're naughty'. Whereas they're being brought up in 'You do this. If you can't, you do the best you can'. It's a completely different style, which I think is lovely. I didn't have any trouble in the old system, but I saw kids having trouble – one of my best friends, and she and I were probably on a par intellectually.

But most parents did not know how children were assessed, and some of those we spoke to were quite mistaken in their understanding of what happened at their child's school. There was a prevailing, though not universal, trust that work was assessed, progress monitored – and that parents would be told if there was any difficulty.

> I have often wondered what they base progress on. I suppose they give them tests and things, but I'm sure if there's any problem, if he wasn't keeping up, the teachers would tell me.

Interviews

Parents often mentioned the parent-teacher interview as a useful source, or reassurance, of their child's progress at school.

> The first term parent-teacher interview was good. They said he had been picking up things. He misses out some of his words, and uses others in the wrong place, and I correct him.
>
> We don't have a clear conception of where she should be, especially in maths. We did ask specifically about that at the parent interview, and accepted the teacher's judgement that she was doing fine.

Some gained knowledge to help them help their own child.

> The teacher pointed out to me letters that Shane was doing wrong, and I could do them with him, show him how to do them... I'm really quite happy with his schooling and the progress he's making. He can read quite well now.

…Parents expect that correct spelling should come before writing stories. ”

Assessment beyond the school

A quarter of the parents in our study worked out for themselves where their child was in relation to older children in the family, friends who went to different schools, or their own schooling.

> My daughter was far more advanced at reading than Oliver is but I don't know that her comprehension was always as good.
>
> We're not sure what sort of progress she should have made. It's hard to have a benchmark. She seems to be doing perfectly well, to be competent...I've noticed one child in particular who she sees from time to time who seemed to be further ahead in terms of her writing ability than Emma was, writing stories herself. And the parents of the child made comments on it. I think there are children who are progressing more quickly than Emma – but all the ones we can compare with are going to read perfectly well and reach a particular level. Whether one will reach a level six months ahead of the others, who knows. They're all going to be perfectly competent.

Uneven progress

The last quotation brings us to a central issue for contemporary teachers: what kind of evidence of progress is most appropriate and useful. Progress, in the eyes of the teachers in our study, was a spiral, rather than linear process – or sometimes a process with sudden, unpredictable leaps followed by plateaux, or very gentle rises. Examples were given to us of children whose rapid speed of skill acquisition in the first few years of schooling was followed by levelling, or some decline, so that they could be surpassed by others whose initial school progress had been less marked.

Teachers now also generally accept that children learn at different rates, sometimes through different routes. The research evidence which says that internal motivation is very important to children's learning is also accepted. Though most classes did their reading and mathematics work in ability groups, only one school used the colour codes of reading book levels to name their groups. Stickers and stamps were given out in many classrooms, but they were given to encourage as well as reward; and some teachers kept close records of who had received what, to ensure an even spread. Assessment was mainly through individual running records and curriculum checkpoints rather than class tests of the same items.

New Zealand junior school classrooms are remarkably free of the standardising format of American classrooms with their strong emphasis on tests and grades (even to the extent of putting the results up on classroom walls). Nonetheless, some practices (such as ability grouping) which allow comparison and suggest there are reliable standards to measure individual children against, are still present, and they were indeed used by the parents in our study to satisfy themselves (or not) about their children's progress.

The shift in teaching to diagnostic rather than summary assessment means that 'results' often need knowledge of the curriculum to be fully understood or appreciated. They need more translation for parents, especially for those raised themselves on fixed 'standards'.

How can the classroom teacher ride at the same time the two horses of (1) encouraging internal motivation and (2) providing evidence of progress in summary form for parents and others beyond the classroom process? It is not a dilemma that is about to go away: on the contrary. There is increasing emphasis at the national level on accountability and standards, and these set frameworks which classroom teachers cannot ignore. New South Wales, for example, introduced compulsory basic skills testing in literacy and numeracy in the third and sixth grades in 1989. The new New Zealand assessment framework is designed to provide information on levels of achievement at school entrance, and at Form 1 (Year 7) and Form 4 (Year 10). The New Zealand national assessment is likely to have an item-bank format, allowing teacher choice. If this format is accepted, it will provide more flexibility than the New South Wales system. Nonetheless, in New Zealand, concerns have been expressed that use of the 'framework' could foster inter-child and inter-school comparison. Also the framework of levels makes it easy to slide (back) into thinking all children must meet a set standard at a certain stage or age, despite the very real difficulties in deciding or defining that standard.

Parents undermine teachers?

Our interviews found teachers worrying about parents undermining their best efforts with old fashioned attitudes or discouraging teaching techniques. Parents' approach to reading, writing, and mathematics may differ from those used today in the classroom. Old school techniques such as rote learning and copying have been overtaken. It is often hard for teachers to see the 'help' parents give their children at home as positive if it comes in these forms. Yet, like the teachers' own balancing act (with the distribution of stickers and stamps, and the names they give ability groups so that they do not order the children into a frozen hierarchy of ability and expectation) perhaps it is the total context of learning which matters most rather than individual practices. Recent research material on home reading certainly suggests that different approaches to reading and texts can complement rather than compete with the school approach (with its emphasis on fictional 'stories') and this even when there are different cultures in the home.

"...Our interviews found teachers worrying about parents undermining their best efforts with old-fashioned attitudes."

Teachers' concern about parental practices at home is also an expression of the ambiguity they feel in their joint responsibility, with parents, for children. How can they ensure that parents are indeed supportive?

The teachers in the study thought it was important for parents to support their children. As far as school work was concerned, they wanted parents to hear their child read at home, check or help with their spelling (if they were doing some writing or spelling at home), and show interest in their work and progress. Parents were seen as interested if they came to collect their child after school, stayed to look at the classroom and their child's work, signed the reading books sent home (and actually listened to the child), turned up to parent-teacher interviews, and contacted the teacher to let her know of any concerns, or changes in the home.

> Parents put pressure on children to do extra things, they always expect them to be on top form....one parent does multiplication tables with his child, yet the child has no concepts for anything. Parents want to know if their child will go onto Standard 1 (Year 2), as though that was the point to aim for as quickly as possible. They won't accept differences in children, and be supportive and say, 'Well done'. If one child they know reads twice as fast or twice as many books, they want their child to do the same.

They worry about the spelling, but not the flow of stories in writing.

> Earlier in the year we had parents dashing in at 3 o'clock, opening the child's tote bag, searching through all their books to see what they've done during the day and saying 'Where's your reading book?' The kids are just shaking. And we try to say to them, 'Look, the children have been at school 5 hours, they've had enough, they want to go home and have a break.'

Teachers try to protect children's confidence, motivation and free time. But in the process they – and the children they care for – may miss out on the benefits of closer work with parents. Well-informed parents are more likely to be supportive of both teacher and child. This becomes increasingly important in devolved school systems (such as New Zealand's has become, and as some states are heading toward in Australia) for two reasons. First, parents, as trustees, are now responsible for school policy and employment. Second, there is an increasing emphasis (or reliance) on local resources. This means that there are growing gaps between schools in different communities.

The human, financial and cultural resources available to a child at home also make a difference in children's learning, often favouring children of middle class (and assertive) parents. Improving the resources parents can provide, or making better use of those resources, is therefore increasingly vital to the success of teaching, particularly in low income areas.

The value of parental support and understanding may seem obvious to many classroom teachers, and to others simply another item to add to the list of good-things-to-be-done, but-where-will-I-find-the-time? Many have tried innovative sessions for parents only to find that those who turned up were 'not the ones who needed to'. But the issue will not go away, and every school and teacher would benefit from devising a kit of various strategies for working with parents, ranging from 'preparing the ground', through, keeping information flowing both ways, to, dealing with potentially awkward situations when they arise.

Certainly there are questions of time to be resolved. Often teaching is seen as consisting of one teacher with a class, face to face with children. But planning is part of good teaching, as are other activities which teachers undertake outside the classroom. Perhaps it is less important than we think for children to spend the whole of their day with a single teacher.

Effective occasions with parents

In our study there were few occasions on which teachers had made an effort to reach parents to explain their approach to the curriculum. These occasions were in fact all a great success.

> They had a lovely night in the middle term when they got parents down and they went through a typical writing session and how they model and get ideas and they got parents writing and parents found it really hard!

> By watching Suzanne for about half an hour one morning writing I have a much better idea of what writing is about, and the importance of the flow of writing rather than getting everything correct. I don't want more bits of paper.

Parents also need to know how to best approach teachers to find out about their child's school life and progress, or to express any unease they feel. One strategy schools and individual teachers could use is to launch the year with a session involving role-play and good humour (perhaps using training videos such as John Cleese has made?) to bring teachers and parents together. And avoid episodes like this:

> I find it difficult to respond to somebody who comes to the door in class time with, 'How's he getting on?'. Because **he**'s there, and so's everybody else. And that's when you say, 'fine, no problem'.

Sharing responses to situations like this is a useful focus for staff development. It's also important to analyse existing home-school channels such as homework (or what goes home), teacher-parent interviews, and reports, to see whether they are meeting the needs of both teachers and parents, and whether they could be made more vital.

The development of teaching as a profession has continually pushed forward our understanding of the ingredients and processes of learning and what can be achieved. Perhaps working with parents, translating the work of the school into the terms of the home, and vice versa, is the next frontier to be crossed.

set would like to publish another item on the topic of school-parent communication – a 'what works' compilation of teachers' own innovations and practices. So please write to us if you have useful ideas to pass on: set, P O Box 3237, Wellington, New Zealand.

Notes

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This research can be read in more detail and context in *Learning to Learn: Children's Progress Through the First Three Years of School* by Cathy Wylie and Lesley Smith, published by NZCER.

The research literature on the importance of children's internal motivation is well covered in:
  Crooks, Terence J (1989) The Impact of Classroom Evaluation Practices on Students *Review of Educational Research* Vol 58(4), pp 438-481.
and
  Dweck, Carol S (1989) Motivation. In Lesgold, Alan and Glaser, Robert (eds) *Foundations for a Psychology of Education*. Hillsdale: Lawrence Erlbaum Associates.

The research findings on how learning can be undermined by ranking and streaming can be found in:
  Kamii, Constance (ed) (1990) *Achievement Testing in the Early Grades: the Games Grown-ups Play*. Washington DC: National Association for the Education of Young Children.
and
  Kealey, Martin (1984) Meats and veges: an ethnographic study of two grammar school classes. ***set*** No. 2, 1984, item 10.
and
  Raven, John (1991) *The Tragic Illusion: Educational Testing*. New York: Trillium Press.

Material on the growing gaps between schools in different communities can be found in
  Gordon, Liz (1993) *'Rich' and 'Poor' Schools in Aotearoa*. A paper presented at the Annual Conference of the New Zealand Association for Research in Education, Hamilton.
and
  Wylie, Cathy (1992) *The Impact of Tomorrow's Schools in Primary Schools and Intermediates 1991 Survey Report*. Wellington: NZCER.

Material on the difference home resources often make can be found in
  Lareau, Annette (1989) *Home Advantage: Social Class and Parental Intervention in Elementary Education*. Lewes: Falmer Press.
and
  Nash, Roy (1993) *Succeeding Generations – Family Resources and Access to Education in New Zealand*. Auckland: Oxford University Press.

Material suggesting that home approaches to reading and text which differ from those of school can complement rather than undermine school teaching is contained in
  McNaughton, Stuart (1991) *Emergent Literacies, Psychologies of Development, and Equity* Research Unit for Maori Education/Te Tari Rangahau O Te Matauranga Maori, University of Auckland, Monograph No 2.

A useful description of teacher training in New Zealand, based on following students who started their training in 1989 through until they started teaching, is given in
  Renwick, Margery, and June Vize (1993) *A Window on Teacher Education*. Wellington: NZCER.

Two useful resources for teachers wanting to work with parents are:
  Ramsay, Peter et al (1990) *'There's No Going Back' Collaborative Decision Making in Education. Final Report*. Hamilton: University of Waikato.
and
  Wickham, Leon, and Parents (undated) *TeacherPak – a Book about Teacher-Professional Parent Partnership*. Palmerston North: Kanuka Grove Teacher Centre, Palmerston North College of Education.

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The Mathematical Needs of School Leavers

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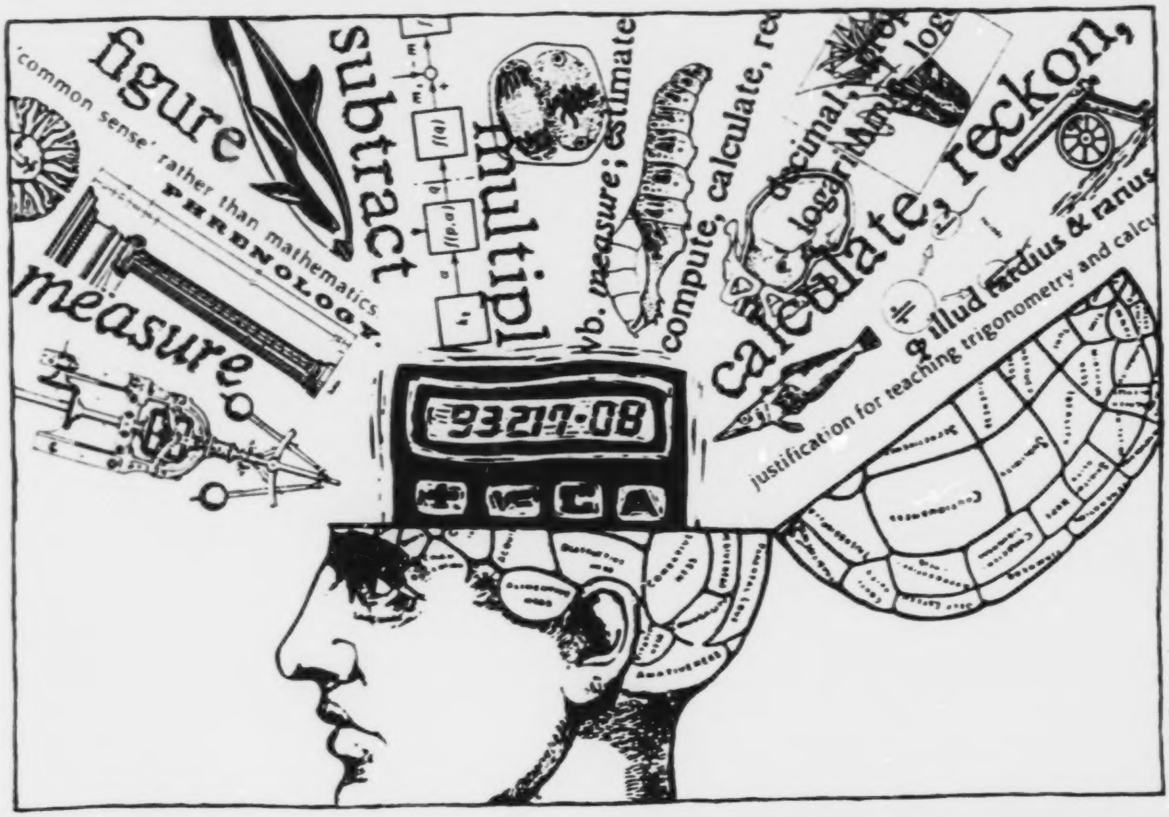
Massey University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Introduction

What are

(a) the mathematical needs of everyday adult life;
(b) the mathematical needs of employment;
(c) the mathematical needs of those going on to further education?

We were asked to find out and to report any implications for current developments in curricula and national assessment.

Mathematics in Everyday Life

A random sample was chosen from the electoral rolls. These people were interviewed, with questions about a wide range of everyday tasks such as supermarket shopping, income tax returns, cooking, and hobbies. To avoid problems which had arisen in other similar research, every effort was made to avoid the impression that the survey was some form of mathematics test. While it would have been useful to know how *well* people are using mathematics in their everyday lives, it will come as no surprise to teachers that people are reluctant to take a mathematics test unless they have to! They are also unlikely to admit to using a mathematical technique if they know that they will be tested on it.

A further problem (apparent in other research too) is that if you ask people what mathematics they use in their lives, they interpret the word mathematics in a very narrow way, thinking of the pencil and paper methods of the classroom. They are most unlikely to consider the general quantitative and spatial judgements which we make every day in mathematics. These skills are more likely to be called 'common sense' rather than mathematics.

Consequently, the interviews were very much task-based and many of those interviewed were surprised how important mathematics was in their lives. One woman remarked:

> *You said you came to ask me about the mathematics I use. Now you know all about my life.*

Table 1

Percentage of people who use mathematics in everyday tasks

Task	% using mathematics in the task	
	Female	Male
Supermarket shopping	87	65
Gardening	46	74
Cooking	89	35
Knitting and sewing	78	9
Painting and wallpapering	22	84
Making curtains	39	9
Building, carpentry, etc.	7	67
Running a car	39	79
Holidays	70	74
Sport	35	58
Gambling	9	26
Hobbies	48	60
Cheque account	37	40
Tax return	41	63
Mortgage, investments, etc.	26	47

The mathematics used in these tasks was, not surprisingly, mostly elementary in character. Arithmetic, measurement and simple geometric concepts were predominant. The important feature was the ability to use these simple mathematical tools appropriately in a variety of situations. The ability to make sensible quantitative judgements based on mental arithmetic and estimation was at least as important as the ability to carry out pencil and paper calculations.

Calculators were widely used in those tasks, such as filling in an income tax form, in which an exact answer was required. 86 percent of people under 45 used a calculator. As might be expected, only 46 percent of those over 45 used one.

A significant feature of many of the tasks was that they involved solving problems. In supermarket shopping, for example, people have to decide whether or not they need to know the total cost of the groceries in their trolley before they reach the checkout, and if so how accurate this calculation needs to be. They will also make 'best buy' calculations, choosing between products and sizes. There was a great variety in the methods used. One woman, for example, rejected the usual comparisons based on weight or volume and price in favour of a 'meal size' price comparison. The best buy for her was the cheapest pack of mince which would suffice for one meal. The fact that a larger pack had a lower price per kilogram was unimportant if it would not all be eaten, or some would be thrown away, after one meal. Similarly a large, low unit-price, packet of biscuits might be uneconomic since, 'they will eat them all at one sitting anyway'.

Similar problem-solving situations were apparent in cooking, gardening, wallpapering, and making curtains. If schools are to prepare students for making these kinds of judgements, perhaps, instead of teaching specific procedures to solve problems. For example, to find the number of rolls of wallpaper needed to decorate a room we should be asking:

> How many ways can you think of to solve this problem? Discuss the advantages and disadvantages of each. Under what circumstances might one method be better than another?

There are obvious opportunities for group work in this approach.

Mathematics in the Workplace

For the workplace survey a variety of businesses were selected. The sample included small operations such as a hairdresser, a farmer and a motel operator; larger businesses such as a department store, a fibreglass product manufacturer and an insurance office; and major enterprises such as a coal mine, a car assembly plant, a government research establishment and a large financial corporation. The sample was checked against a Standard New Zealand Industrial Classification to make sure it was representative.

Within these workplaces individuals were chosen (for interview) to give a wide range of occupations. These included cleaner, truckdriver, manager, pilot, salesperson, mechanic, estate agent, matron, miner, graphic artist, reporter, market researcher, cook, labourer, etc.

Again we held interviews concentrating on *tasks* which might involve mathematics and then looking more specifically at the mathematics *skills* used in these tasks.

The task questions were of the type: "Have you ever in the course of your present job in this Company needed to...?"

As an example, in response to a question asking about data collection, 65 percent of the respondents said that they did collect numerical information in the course of their job. Examples included occupancy rates in a rest home, petrol pump readings, flight log-book information, financial records, spraying schedules, the results of flow testing of hydrants, container utilisation, and sales records.

Some of the results are presented in Table 2.

Table 2

Percentage of people who use mathematics tasks in the workplace

Task	% of workforce	
	Female	Male
Count things?	98	95
Estimate sizes or quantities?	77	91
Measure anything?	59	81
Collect data?	63	66
Do any sampling?	13	39
Use a formula to calculate something?	49	66
Optimise anything?	69	91
Receive or pay out money?	74	43
Do any bookkeeping?	40	39
Use a calculator?	85	88
Use a computer?	61	54

In the skills section of the interviews we concentrated on the mathematical skills which were used in the tasks. For example, in order to gather information on the informal geometry which people might use, we asked them if they ever needed to position or arrange objects or shapes either to pack them into a small space, to make a functional layout, or to make an attractive pattern. 68 percent replied that they did.

Some responses to questions of the type: 'In the course of your job do you...?' are presented in Table 3.

Table 3

Percentage of people using specific mathematical skills in the workplace

Skill	% of workforce	
	Female	Male
Summarize data	51	52
Organize data	67	67
Extract information from data	63	69
Make decisions on incomplete information	54	67
Try to determine a 'best strategy' to follow	74	85
Use symbols or letters to represent numbers	17	40
Use geometric concepts	56	76
Use trig functions	1	21
Use calculus	2	8
Use arithmetic	94	95

One of the more surprising findings is the large proportion (84 percent) of people who indicated that in the course of their job they needed to optimise something, that is, to make the best use of available resources. The techniques they used ranged from very simple ones based on experience to sophisticated computer modelling.

29 percent used informal methods based on experience to switch things around until they were satisfied with the performance. 12 percent were trying to make the best use of time, either their own or that of their staff. A further 35 percent were making decisions where costs and quantities were involved. Examples included optimising the use of two storage tanks, scheduling labour, organising routes for deliveries, minimising the cost of constructing doors, inventory control, and the application of fertilizer.

Another 6 percent used more sophisticated mathematical optimisation techniques, often using computers. For example, a government department used the critical path method in planning, and a large delivery firm used a computer simulation model to minimise the costs to customers, to optimise the use of manpower and vehicles, and to maximise profit.

Mathematics in Further Education

Questionnaires, not interviews were used. Teachers of courses in polytechnics, colleges of education and universities were asked what mathematical topics were needed by students entering their courses. The sample was not random: humanities courses were specifically excluded but otherwise an attempt was made to cover the range of programmes currently being offered in the tertiary sector.

The data collected were analysed both in relation to fields of study such as Teacher Training, Commerce, Science, etc., and according to the likely entry levels of students.

The analysis indicated that most students entering tertiary education courses (other than in the humanities) need:

- to be computer literate and to have good calculator skills;
- to have a thorough understanding of percentages, ratio and proportion;
- to be confident in making a variety of measurements and in calculating areas, and volumes;
- to be able to estimate quantities and to estimate the associated errors;
- to be able to use the algebra associated with the use of formulae, the changing of simple word statements into symbols and equations, and the solution of simple (linear) equations.

Some courses from all the fields of study (except service trades) also made use of:

- geometric skills
- trigonometry
- exponential functions
- vectors.

Mathematical Topics in the Curriculum

Table 4 gives a summary of the survey estimates of the use of mathematical topics in everyday life, in employment and in further education. The topics are ordered roughly from most used to least used.

Table 4

Percentage of people who use mathematics

Topic	% of population using the topic in everyday life	% of workforce using the topic in employment	% of surveyed further education courses using the topic
Arithmetic	96	100	98
Use of calculators	55	87	87
Measurement	84	82	45
Statistics	7	83	89
Geometry	71	68	37
Algebra-use of formulae	5	60	76
Use of computers	22	56	51
Algebra-solving equations etc.	1	20	59
Trigonometry-triangles etc.	1	11	27
Trigonometry-formulae	0	7	23
Calculus	1	6	18

The table indicates that some topics are likely to be used by more than half the students in their employment. These are arithmetic, calculators, measurement, statistics, geometry, algebraic formulae and computers. These, plus algebraic equations, (but not geometry) are needed in more than half the further education courses. Consequently, *utility* justifies teaching these topics to all secondary school students.

The justification for teaching trigonometry and calculus is less easy. It has to depend on a deeper consideration of the question of why we teach mathematics. Are there reasons other than pure utility? If so, what are these reasons, and are trigonometry and calculus the best topics for achieving these other objectives?

Problem Solving

In addition to the technical mathematical skills associated with the topics identified in table 4, the survey very clearly revealed the need for more generic problem-solving skills.

The role of problem-solving was particularly evident in the employment survey. It was estimated that of the workforce:

81% are involved in procedures which try to determine a 'best strategy' to follow;

84% have needed to optimize something in the course of their current job;

63% need to make decisions based on incomplete information;

67% extract information from data;

62% position or arrange objects or shapes to make a functional layout;

71% need some mathematics to read reports, articles, journals or research.

None of these activities is 'technique oriented'. For example, it would be possible to excel at the routine skills of adding fractions, solving quadratic equations, using the cosine rule, and differentiating using the product rule, but have very little skill in the process tasks above. This was also true in the everyday life survey where a number of situations called for judgement rather than the application of an established mathematical procedure.

Mathematics in the New Zealand Curriculum

This research was carried out in New Zealand and therefore in the full report the implications for the New Zealand curriculm and New Zealand national assessment are drawn out. The new mathematics curriculum from classes J1 to F7 which is being introduced in 1993 and 1994 includes some important changes in emphasis. These are:

(i) a strong emphasis on problem solving, with a specific 'strand' on mathematical processes;

(ii) an emphasis on statistics (which has its own "strand" from Level 1 to Level 8)

(iii) the recognition of the importance of calculators and computers.

The results of our survey give very strong support for these changes in emphasis.

Mathematics in Australian Curricula

Although this survey was carried out in New Zealand there are implications for Australian curricula, the mathematical needs of industry, adults, and children in both countries not being dissimilar.

The Status of Topics in the Curriculum

The survey produced clear evidence that the single most important mathematical ability required by people both in everyday life and in employment is the ability to make sensible quantitative judgements in problem-solving situations. These judgements are most likely to involve estimation and to be based on mental arithmetic.

It seems that such skills are undervalued in an educational system in which status is given, almost entirely, to topics which occur in examination prescriptions and papers. In New Zealand School Certificate and Bursary examinations dominate the secondary school curriculum. Their emphases are on algebraic, trigonometric, formal geometry and calculus skills. The survey shows these will be used by relatively few students.

Some schools provide courses which are not geared to these examinations, but they tend to be dismissed by students, parents and sometimes teachers, as 'vege maths'. Consideration needs to be given to ways in which these essential skills can be given status within the system. Students should have the opportunity to prove to themselves, to their parents, and to future employers that they have mastered the most important skills for functioning effectively at home and at work.

Gender Issues

There were very clear gender differences in the use of mathematics both in everyday life and in the workplace. Most of these differences seem to reflect the fact that (in New Zealand society at least) men and women tend to undertake different tasks in the home, to have different hobbies, and are employed in different sections of the workforce.

There was some suggestion, however, in the data, that men and women engaged in the same task involving mathematics, tend to approach it differently. This possibility will be the focus of further research.

Notes

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Mr Greg Arnold, Dr Michael Carter, Mr Peter Kelly, Dr Gillian Thornley are Senior Lecturers in the Mathematics Department at Massey University, Private Bag, Palmerston North, New Zealand.

This research was carried out for the New Zealand Ministry of Education, in 1992. The full report is:

Knight, G., Arnold, G., Carter, M., Kelly, P. and Thornley, G. (1992) *The Mathematical Needs of New Zealand School Leavers: A Research Report*, Palmerston North: Massey University.

The sampling procedure for the workplace survey was designed to select a cluster of occupations selected from a random sample within strata defined by the NZ Standard Industrial Classification.

New Zealand curriculum information can be found in Ministry of Education (1992) *Mathematics in the New Zealand Curriculum*, Wellington: Ministry of Education.

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item 6

set
number one 1994

LITERACY ON THE JOB

Patrick Griffin

MODERN INDUSTRY needs literate workers. How literate? How can workers' reading, writing and maths be improved? What can schools learn about necessary literacy and what can they teach? Investigations with BHP gave some answers to these questions.

Introduction

- Modern industry needs literate workers.
- Schools are looking for ways to make sure that all pupils leave school functionally literate.

HOWEVER, the exact needs of jobs, both for present day tasks, and for on-the-job training in the future, are not well understood. Employers are good at media releases which berate schools for not providing workers with the skills they need, but when researchers look at the actual skills the jobs require, the skills are usually much less complex than the employers are asking for. One skills-researcher has said that almost all jobs require no more skill than it takes to drive a car.

One piece of such research, by Michael Reid, written up in ***set*** No. 2, 1984, Item 15, matched the skills that school history gives with the skills employers asked for in clerks. He found that history studies were much more demanding than the day to day work of the clerks. In a later interview with an employer who had demanded 3 years secondary education and certificate passes in Maths and English, the boss grudgingly admitted that almost all that was needed was 'they must know their alphabet.'

There is a drive in most schools to increase job-related literacy. But many older workers missed out. This item examines literacy problems in Australian heavy industry.

The literacy situation

Reports from Australian industry say that too many workers have insufficient communication skills. One survey in Australia suggests that 15% are functionally illiterate. Workers understand the importance of literacy and numeracy skills because new structures reward the well-educated. In Australia many new awards and pay scales are related to a worker's capacity to participate in training programmes. However, the economic problems, resulting from workers being unable to cope with the literacy demands of their jobs are increasing; for example there are major problems when workers are unable to read warning signs or follow written directions.

Many industries will spend millions of dollars to overcome the problems arising from poor worker literacy. Lower paid workers with little education may be part of the problem but the problem can be identified in middle and upper management also. One solution is to sack illiterate workers and pay out large redundancy bills. The other is to make present workers more literate through training on the job. My study examined the workers' reading activity and the nature of the reading materials most commonly encountered in the workplace, perhaps to clarify if training, rather than wholesale redundancies, was a better option.

It should be noted that on-the-job reading tasks differ from traditional classroom reading tasks: the emphasis in on-the-job reading is on locating information for immediate use and problem solving; traditional classroom reading focuses on 'internalising' information for future reference. *Reading-to-do* needs to be distinguished from *reading-to-learn*.

Equity is also an important issue. Without the access skills of literacy and numeracy, many workers will be unable to benefit from the new award classification or contracts which stress self reliance. Marginalisation of workers without basic access skills of language, literacy and numeracy is already a reality; issues of safety and productivity highlight the necessity to ensure effective communication skills in English for all workers; and careers are linked to training and hence to access skills. Programmes are needed to redress possible issues of inequity that may arise as a result of restructuring.

For this research the ALAN scales that describe 9 levels of literacy were used to develop an interview protocol, based on authentic reading, writing and numeracy tasks that employees would be expected to perform on the job. More than 350 employees were interviewed in the construction industry and 251 in the steel industry. In a separate study 603 employers were interviewed in the automotive industry – this last study is not reported here but its conclusions are taken into account.

The tests

Broad-range tests of reading, numeracy and writing in industrial settings were devised. The tasks in them ranged from recognising and being able to distinguish between letters and numbers, reading a simple sentence, identifying a major point in a short prose passage, reading a timetable, a notice from a notice board, a workplace magazine article, integrating information from a range of sources and making judgements about the relevance and levels of meaning in a commonly encountered type of information brochure. (See the description of the ALAN Scales at the end of the **Notes** section.)

In numeracy, the tasks are about the ability to recognise simple numbers, to identify days of the week in a calendar, to match numbers from a workplace parts list, to complete simple operations with whole numbers, to read and interpret graphs and to solve numerical problems associated with employment related tasks. Writing was assessed by setting simple tasks, such as writing the worker's own name and address, writing a dictated job instruction sentence and then a description of the job. Each task was based on text material commonly encountered by the workers.

The research

In heavy and construction industries, the majority of the workforce is male. In the steel industry sample only 25 percent were born in Australia, and more than 50 percent were over 40 years of age. In the construction industry we tested and interviewed mostly those with English-speaking backgrounds. Almost 70 percent had participated in secondary education or had received additional training, and almost 50 percent had attended a vocational training course in Australia.

Thus we were looking at a stable workforce, with more than a basic education, a great deal of experience in the industry, and most had lived in Australia for more than 20 years.

Reading for the job

The study identified the literacy tasks expected of the workers. An important difference between the tasks the steel workers and construction workers were asked to do was that steel workers had to read parts lists and construction workers had to read site plans. All other reading tasks were common. It was quite different from school reading (where continuous prose is the most usual form).

Findings

1. The most commonly read materials in industry are notices. These notices are written by both the company and the union. They provide information pertinent to the worker's personal well being.
2. A large number of workers (19%) do not read anything, including notices, when at work. Thus their safety, instructions, their rights, and their responsibilities, have to be communicated in some other way.
3. Minutes of group meetings, manuals, operating procedures, memos and reports are read only by a few of the workers.
4. There is a relationship among the types of materials read and the amount of reading done by the worker (with the exception of site plans). Those who do not read union notices for example, do not read any other materials. Union notices *are* read by the least active readers. The most active readers may read training manuals, reports, service manuals, memos, and most other reading material.

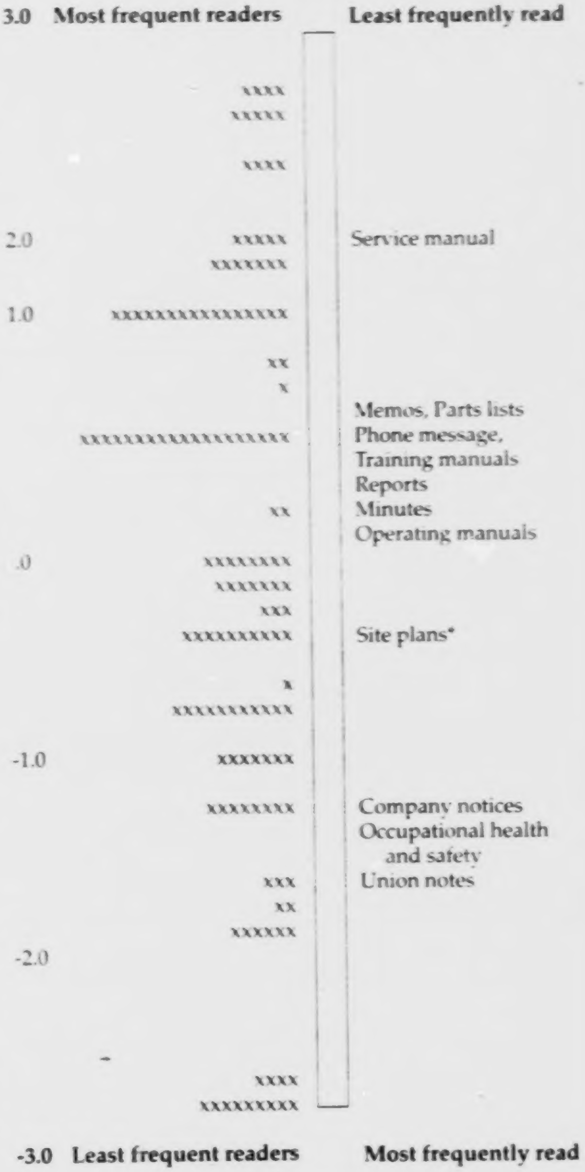
Any literacy development programme would be wise to start with notices from the union, the company and from the Occupational Health and Safety section. These are the most likely to be read by the majority of workers. Once they are comfortable with this type of literature the 'non-readers' could go on to read other types of workplace literature.

Chart 1 maps the distribution of the workers and the literacy materials found in the workplace. The item 'site plans' is asterisked, because it is a special case. The relationship is independent of the union, the workplace or any other description.

Generally there is a significant relationship between literacy and numeracy levels: the more literacy activities they are busy with, the higher their literacy and numeracy

Chart 1

Literacy Activity Scale



scores. This is not the case, however, for phone messages: there is no relationship between phone messages and other skills levels.

Table 1

Correlations between Reading and Literacy Score

	Reading	Writing	Numeracy
Union papers	.504	.451	.351
Operating procedures	.471	.407	.349
OHS papers	.420	.355	.354
Company notes	.394	.413	.392
Minutes	.352	.302	.301
Training manuals	.302	.232	.274
Parts lists	.264	.247	.303
Memos	.254	.184	.192
Reports	.247	.285	.146
Phone messages	.130	.012	.016

Literacy levels

Many of the workers believed that their current literacy and communication skills have held back their careers in some way.

But knowing the levels of reading, writing and numeracy and even the workers' estimates of their needs, does not lay out the picture of what training is needed. Table 2 shows the percentages of workers (based on the tests) who need long term, intermediate, or short term assistance, and the proportion who could be regarded as ready to participate in training programmes.

> “...19% do not read anything, including notices, when at work.”

This analysis demonstrates the size of the task. The literacy skills of many workers are at levels which would make job training difficult, if not meaningless. Just over half have reading levels which show they could handle new job training programmes in which they were expected to be independent learners. But almost a quarter (24.3 percent) have reading levels below that which would enable normal access to text based information.

The literacy training needs are also related to age of the employees. In reading, more than half of the group requiring long term assistance were in the 30 to 50 age bracket.

It was also evident that there was a relationship between the language background of the workers and the learning group in which they were identified. Even on a pro rata basis, the problem is far greater in the non-English-speaking background (NESB) group. In **reading**, less than 10 percent of the English-speaking background (ESB) group require extensive assistance. In the NESB group, the proportion is approximately 25 percent. In **writing**, the situation is similar: of the ESB group, 21.3 percent require extensive assistance; in the NESB group, the figure is 62.6 percent. In **speaking** the major group in need of assistance is again the NESB group. The conclusion is that more than 10 percent of the worker population have insufficient speaking, reading and writing skills to participate in the current workforce.

The problem appears to be far greater among older, migrant workers, than among recent school leavers. This has important implications for those who maintain that literacy problems in the workforce are attributable to poor present day local schooling.

Conclusions for industry

In Australia, award restructuring in these industries means that pay will depend to some extent on taking training courses. For many, the higher levels of pay that come with completing a course, will be out of reach. New Zealand, it would seem, has gone down the path of making illiterate workers redundant. It would be interesting to know how many cannot get back into employment because they cannot manage training courses. Principles of equity and access may become the focus of groups concerned with issues of justice in the workplace. From the analyses we can develop several conclusions.

First, literacy difficulties are part of an overall language and communication problem. Workers with spoken language difficulties are also likely to have difficulties in reading and writing. The awareness by workers of the increasing importance of literacy in award restructuring, or contract negotiation, gives employers potential added difficulties. If pay increases, or even a job at all, are to depend on the ability to undertake training courses, then it may be argued that the opportunity to acquire the skills of literacy and numeracy (to do those courses) should be provided. Employees will ask for assistance if increments, and hence better living conditions, are dependent on skill acquisition. Employers and governments have some agonising decisions to make.

Second, this study shows the ability to process information, not only in training courses, but on the job (in manu-

Table 2

Assistance needed before participation in training programmes
Percentages of workforce

		Assistance in Writing				Total
		long term	inter-mediate	short term	ready for training	
Assistance in Reading	long term	23.9	0.4			24.3
	intermediate	4.8	4.4	0.8		10.0
	short term	3.2	3.6	4.0	2.4	13.1
	ready for training	4.8	6.8	9.6	31.5	52.6
Total		36.7	15.1	14.3	33.9	100.0

als, minutes, notices and safety information) is hampered by lack of literacy skills. Employers therefore have a dual reason for raising communication skill levels of the workforce. An enterprise or industry introducing quality management procedures (for increased efficiency and flexibility among the workforce) will be restricted if the workforce lacks basic literacy and numeracy skills. The evidence in this study supports similar studies in the automotive industry and suggests that the problem is widespread.

Third, the most frequently read materials are about personal needs rather than the tasks of the job. Almost one in five workers read nothing at all. The analysis of what was read suggests that beginning readers may be best introduced to literature about their rights and responsibilities, and not about the job itself. Perhaps workers should read union, company and safety materials in order to locate specific information and to solve problems associated with personal needs, first. Only after these have been resolved, should reading turn to the execution of the job. Reading levels certainly need to be raised before job-related materials will be read by every worker.

It is also clear from this study that the problem is not confined to those workers from non-English-speaking backgrounds. Workers from English-speaking backgrounds must also be taken into account and be included in communication and numeracy training by the industries concerned.

Conclusions for schools

Basic arithmetical literacy (numeracy) is reasonably easy to teach and to assess. However, the basic skills of literacy are not. The speaking, reading and writing skills necessary in the workplace are very difficult to select, to teach, and to assess. Union notices may be a *genre* of their own and the political messages they carry could, in a classroom, be thought of as propaganda. However, there are precedents – the language of school economics, when analysed, appears as just as propagandistic (see 'Literacy in Classrooms...' in ***set*** No. 2, 1993, item 11). Any programme in schools which gives students (and thus workers) an ease with speaking, reading, and writing (even if just writing reports) is going to help greatly. But the experiences, opportunities, topics, material, resources, and so on, needed for this limited teaching goal are wide; and they are not easily put in neat packages, let alone given a cash cost.

Notes

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This ***set*** item is adapted from *Authentic Adult Literacy Assessment*, a paper first presented to the Australian Association for Educational Research Conference 1991.

Similar work in the car industry is published in
Sefton, R. and O'Hara, R. (1992) *Report of Work Placed Education Project: Vehicle Manufacturing*, Melbourne: Victorian Automotive Industry Training Board.

Reports suggesting that up to 15% of adult Australians are functionally illiterate include
Wickert, R. (1989) *No Single Measure*, Canberra: Department of Employment, Education and Training.

and
Miltengi, G. (1988) *English in the Workplace*, Canberra: Office of Multicultural Affairs.

Such figures are questioned in, for example, Sefton and O'Hara, above, and
Griffin, P., Jeffery, Heppenstall and Pollock, *Adult Literacy and Numeracy: Using the ALAN Scales: A Video Production of RMIT*, Melbourne: Royal Melbourne Institute of Technology.

The problems of low paid workers with little education are discussed by M. Santana, in Griffin, Jeffery, Heppenstall and Pollock, above.

That literacy problems are also present among middle and upper management is examined in
Griffin, P. and Forwood, A. (1992) *Adult Literacy and Numeracy Competency Scales*, Canberra: Department of Education, Employment and Training.

The clear distinction between job reading and classroom reading is made in
Diehl, W. (Ed.) *Secondary Reading: Theory and Applications - Monographs on Teaching and Learning No. 1*, Bloomington: Indiana University, School of Education.

Reading-to-do and reading-to-learn are distinguished in
Chall, J. (1987) *Stages of Reading Development*, New York: GcGraw Hill.

The ALAN Scales
The descriptive scales used in this research are called the ALAN scales. They are a series of descriptions of increasing sophistication in reading, writing and numeracy. To gather data to develop the scales, meetings were held with teachers, policy specialists, work supervisors, and employees in a series of workshops. These and the scales are described in Griffin and Forwood above, and by Santana, also see above. Adults representing a range of competence levels were observed and rated on checklists of indicators. The indicators were then sorted using item response theory; see

Wright, B.D. and Masters, G.N. (1982) *Rating Scale Analysis: Rasch Measurement*, Chicago: Mensa Press.

More than 700 subjects from participants in basic literacy classes, apprentices, workplace training programmes, adult year 12 classes, and college students were observed. More than 280 specialists from Australia and other English-speaking countries were approached for comment and assistance.

The reading summary scale is as follows. Teachers may find it useful.

The Reading Summary Scale

A: Recognises familiar words and numerals using a sight vocabulary.

B: Recognises range of words in context. Reads in a specific manner using reading skills that focus on words rather than sentences.

C: Comprehends familiar text presented in simple sentences or point form at a literal level.

D: Reads longer texts and instructions written in a linear sequence. Finds the main idea or important information in short texts.

E: Relates separate pieces of information embedded in separate parts of text. Can link specific pieces of information to the main idea. Copes with longer texts on familiar topics from work or everyday life.

F: Reads a range of text types containing complex but familiar information. Follows detailed instructions. Reads at different speeds (skimming, scanning or detailed reading).

G: Distinguishes different levels of information – main and subordinate ideas. Identifies a range of possible interpretations of the materials. Can identify the relative levels of importance of different pieces of information in the text.

H: Can reconstruct ideas and summarise information in the text. Comprehension takes writer's bias into account. Evaluates conclusions made in the text and drawn from the text.

I: Identifies implicit as well as explicit messages. Identifies undefended assertions. Aware of levels of meaning.

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set
number one 1994

The Young Employed and Unemployed

THEIR USE OF SPARE TIME AND THEIR PSYCHOLOGICAL WELL-BEING

Anthony Winefield, Marika Tiggemann, Helen R. Winefield

BACK IN THE 1930's depression, researchers reported that many unemployed people became apathetic and spent much of their time in the streets engaged in apparently aimless activities. Recent researchers have refined that. They have shown that the impact of unemployment is related to how unemployed people use their time. Those who cope best are busy with purposeful activity and maintain regular contact with people outside the nuclear family. However, further work has pointed out that those young people who are in unsatisfactory jobs are generally no better off than the unemployed.

In 1980 we began a large-scale longitudinal study of school leavers. We were interested in two questions relating to spare time use. First, are there group differences in spare time use? And, if so, were similar differences apparent while the groups were still at school? Only differences that were not present at school can reasonably be attributed to employment or unemployment.

Second, does spare time use play a 'buffering' role in helping young people cope with the stress of unemployment (and possibly unsatisfactory employment)? The young people we were following left school at the end of 1980. In 1987 (a year when our sample of unemployed men and women was most representative) there were 417 satisfactorily employed, 45 dissatisfied with their jobs, and 40 unemployed. Questionnaires and psychological tests were used.

Results

The groups did not differ significantly in self-esteem, depressive affect or negative mood while at school, but in 1987, although the groups did not differ in self-esteem, the satisfied employed (SE) were significantly less depressed and showed less negative mood than the unemployed (U) and dissatisfied employed (DE) groups.

Table 1 presents data on spare time use both in 1980 and in 1987. The groups did not differ in how they used their spare time while at school. Moreover, there were no significant correlations between spare time use and well-being. In 1987, the only significant difference related to the amount of time spent 'doing nothing in particular', with the unemployed (U) spending relatively more time doing nothing than the satisfied employed (SE) and the dissatisfied employed (DE). (Similar results were obtained in the other years.)

For the satisfied employed (SE), there were no significant correlations between any of the measures of well-being and any of the activities in 1987 (nor for any of the years). Depression, negative mood, hopelessness, anomie, were not an important feature of their lives. On the other hand there were a number of significant correlations for both the unemployed (U) and dissatisfied employed (DE) groups in all years. For both groups spare time spent in activities with other people (gregarious activities) was most often correlated with an absence of depression, that is, getting together with other people made them feel cheerful. But for the unemployed (U), time spent doing nothing and time spent watching TV were correlated with depression, hopelessness and other negative feelings.

Discussion

(1) The only difference between the groups was that the unemployed spent more of their spare time doing nothing in particular than the employed groups. The groups had not differed while at school in their use of spare time, so this difference seems to have come from their (un)employed experience, rather than being something 'naturally' part of their personalities.

(2) As others have shown, the psychological well-being of the unemployed was related to how they spent their spare time. Lower self-esteem was associated with the aimless pursuits (doing nothing in particular, watching TV), and higher self-esteem was associated with the purposeful activities (both solitary and gregarious).

It is reasonable to regard 'watching TV' as a generally aimless pursuit and 'solitary activities' and 'activities with other people' as generally purposeful. It might be suggested that there is no real distinction between reading a book (a solitary activity) and watching TV, but reading a book is a purposeful activity, and watching TV, although it may on occasion be purposeful, can be aimless. Reading a book implies a choice, whereas watching TV often involves watching whatever happens to be on.

(3) The overall pattern of results was similar for the dissatisfied employed (DE) – they were cheered by gregarious activities but depressed and felt hopeless when watching TV and 'doing nothing'. There were no such associations in the satisfied employed (SE) group. This is an important finding because it suggests that how people spend their spare time may affect how well they cope not only with unemployment, but also with unsatisfactory employment.

Table 1

Mean spare time spent in various activities
1980 and 1987 for three groups

	Activity							
	Do nothing		Watch TV		Solitary		Gregarious	
Group	1980	1987	1980	1987	1980	1987	1980	1987
Unemployed (U)	1.60	1.69*	2.03	1.92	2.22	2.15	2.42	2.28
Dissatisfied employed (DE)	1.57	1.29	2.09	1.76	2.21	2.24	2.56	2.62
Satisfied employed (SE)	1.52	1.30	2.00	1.83	2.15	2.06	2.73	2.58

* The only significant difference between the groups ($p<.01$).

Another possibility is that both unemployment and unsatisfactory employment have negative effects on well-being, and this in turn affects the quality of spare time use. However, this latter interpretation is inconsistent with the fact that there were no differences in spare time use between the satisfied and dissatisfied employed groups (see Table 1). It appears that it is not a 'chicken and egg' situation, but that using your spare time well comes first – it leads to better coping.

A possible explanation for the difference between the groups is that the satisfied employed (SE) enjoy the benefits of money, status, company, and so on, whereas the dissatisfied employed, like the unemployed, are denied them. If this is so, it may be that the DE and U need to find compensation through their use of spare time. Another possibility, not incompatible with this notion, is that the poorer well-being of DE and U groups is due to relative poverty which restricts their ability to engage in purposeful activities. Stamp collecting, cooking, reading, fiddling with cars, playing sport, and going to discos all cost money whereas doing nothing in particular and watching TV (assuming there is a TV to watch) are free. The fact that the DE expressed overall dissatisfaction with all aspects of their jobs (including the rate of pay) makes this seem likely. Unfortunately our data do not enable us to test this hypothesis.

In conclusion, there are several caveats that need to be mentioned. First, as with other longitudinal studies of adolescence, there was some evidence that the more disaffected dropped out of the group, so we have here findings that don't include them. Second, it is possible that our questions about spare time use were not always sufficiently precise to distinguish between purposeful and aimless activities. On the other hand, our results do suggest that spending spare time in purposeful activities with others may help young people to cope with the stresses of both unemployment and unsatisfactory employment.

Are schools giving their pupils the 'self start' confidence to find purposeful activities if they find themselves unemployed or in unsatisfactory jobs? Are government and non-government organisations aware that helping the unemployed fill in their spare time with clubs, sports, hobbies, associations, will help maintain the mental health of young people, and a healthy society? Are people in general aware that meanness with dole levels puts the community at risk?

Notes

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The longitudinal research, of which just a small part is reported here, can be found further in many papers, for example

Winefield, A.H., Tiggemann M. and Winefield, H.R. (1991) The psychological impact of unemployment and unsatisfactory employment in young men and women: longitudinal and cross-sectional data. *British Journal of Psychology*, No. 82, pp. 473-486.

and

Winefield, A.H., Tiggemann, M. and Goldney, R.D. (1988) Psychological concomitants of satisfactory employment and unemployment in young people. *Social Psychiatry and Psychiatric Epidemiology*, Vol. 23, pp. 149-157.

and in a book

Winefield, A.H., Tiggemann, M., Winefield, H.R. and Goldney, R.D. (1993) *Growing Up with Unemployment*. London: Routledge.

The results and conclusions summarised here can be found in full in

Winefield, A. H., Tiggemann, M., Winefield, H.R. (1992) Spare time use and psychological well-being in employed and unemployed young people. *Journal of Occupational and Organisational Psychology*, Vol. 65, pp. 307-313.

Other set items on unemployment and its effects are

Warr, P. Work, jobs and unemployment, set No.1, 1988, item 6.

and

Levine, S.V. The psychological and social effects of youth unemployment, set No.1, 1981 (NZ Edition), item 5.

Research in the 1930s includes the famous 'Marienthal Study'

Jahoda, M., Lazarsfeld, P.F. and Zeisl, H. (1933) *Marienthal: The Sociography of an Unemployed Community* (English translation, 1971), Chicago: Aldine.

Examples of recent research on the impact of unemployment include

Warr, P.B. (1984) Reported behaviour changes after job loss. *British Journal of Social Psychology*, Vol. 23, pp. 271-275.

and

Fryer, D.M. and McKenna, S.P. (1988) Redundant skills. Temporary unemployment and mental health. In M. Patrickson (Ed.), *Readings in Organisational Behaviour*, pp. 48-70, Sydney: Harper and Row.

That those who are in unsatisfactory jobs are generally no better off psychologically than the unemployed is revealed in

O'Brien, G.E. and Feather, N.T. (1990) The relative effects of unemployment and quality of employment on the affect, work values and personal control of adolescents. *Journal of Occupational Psychology*, Vol. 63, pp. 151-165.

A full list of the psychological tests used is in the *Journal of Occupational and Organisational Psychology* article mentioned above.

A table of the correlations of coefficients between activities and the measures is also in that article.

Acknowledgements

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item 8

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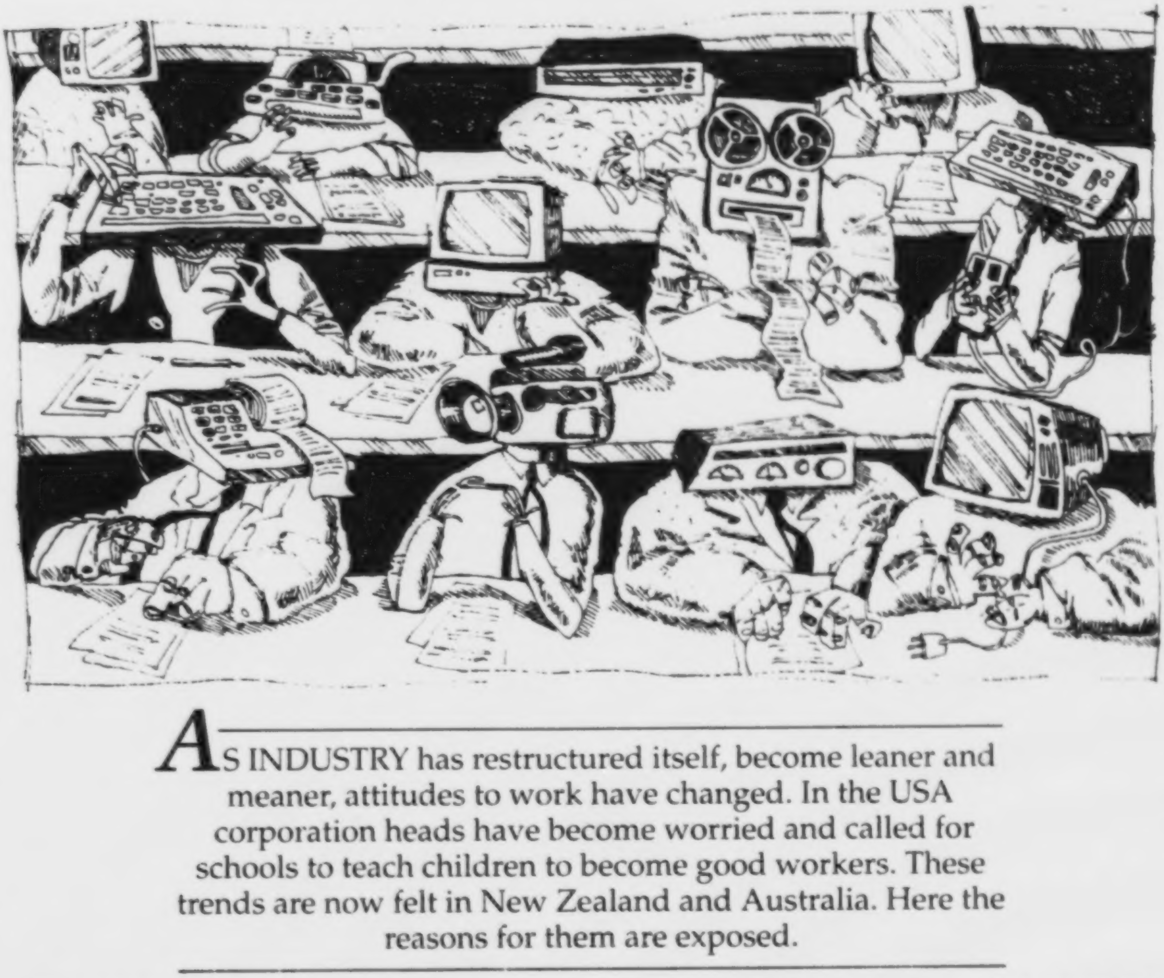
Restructuring Students for Restructured Work

Carol Axtell Ray and Roslyn Arlin Mickelson



Jennifer Lautusi

AS INDUSTRY has restructured itself, become leaner and meaner, attitudes to work have changed. In the USA corporation heads have become worried and called for schools to teach children to become good workers. These trends are now felt in New Zealand and Australia. Here the reasons for them are exposed.

SINCE THE MID-1980s, business leaders, governmental officials, and policy analysts have voiced concerns about the process and outcomes of public education, and have called for its reform. The claim that schools fail to prepare youths to enter the work force is a central part of their critique and is linked to the widely held belief that 'information-age' jobs require better educated workers. Critics charge that unprepared youths are largely responsible for the problems that corporations face in competing in international markets. The general criticism is that public education has put the country at a terrible competitive disadvantage; many seek the complete restructuring of schools using the business model of corporate restructuring.

Analysts with opposing views charge that business leaders have tried to transfer the blame from the economy to the schools. 'Schools may be the scapegoats of political and economic policies; the ... emphasis on failing schools may simply disguise a failing economic system that cannot use an abundance of skilled young people.'

Why do young workers *appear* to be unsuited for contemporary work? One goal of the school reform movement is to restructure students to be better disciplined and more highly motivated workers. But perhaps the problem lies in corporate restructuring, which has implications for the discipline and motivation of high school students and workers.

Discipline and Motivation

The interest of business in educational reform has never been more intense than now, with the possible exception of the educational reform movement early in this century. During that period, business leaders and others mobilized to intervene in education to fashion a disciplined, motivated work force. In particular, the schools were to be reshaped in the image of the rapidly emerging modern, organized factory system following Taylorist and scientific management principles.

By 1916 the business community and the federal government regarded labour turnover as a 'national menace', especially because of the labour shortage caused by the onset of involvement in World War I and the halting of immigration between 1915 and 1920. The regulation and control of the work force became difficult as unemployment dropped from 15 percent in 1915 to 2.4 percent in 1918.

> "...Perhaps the problem lies in corporate restructuring..."

The responsibility for industrial problems, such as lack of discipline and motivation was put upon the educational system. A major task of school reform was to settle social turmoil, cement social division, and promote stability during that period. Public concern shifted from poverty, low wages, and degrading work, to the schools. The schools, rather than the labour market, were to supply the solutions.

Recent Business Concerns

Corporate leaders' active intervention in the educational process again became intense in the 1980s. In the late 1960s business leaders preferred to 'stay off the front page over controversial issues' like equity, civil rights, teachers' strikes and school desegregation. The participation of business leaders on school boards dwindled. What, then, fuelled the renewed interest of business in the public schools in the 1980s? Several economic, demographic, and political changes converged to be called the 'education crisis'.

The Productivity Crisis

Corporate leaders sought changes in national policies, looking for deregulation and an expansion of laissez faire capitalism to address their productivity crisis. Two methods that gained strength in the early 1980s are important for understanding business-led attempts to reform the schools: (1) corporate *culture*; and (2) corporate *restructuring*. These methods are important because advocates of contemporary school reform borrow features from both.

Corporate culture. This is a management technique in which leaders use intense methods for socializing employees into their firms' clearly articulated values and goals. This is supposed to elicit devotion to the firms. The strong-culture firm uses ceremony, ritual, and symbolism to furnish passion and emotion that heightens motivation and thereby fosters excellence. The primary emphasis is on social integration as the company becomes quasi-sacred (in Durkheim's terms) with its workers transformed into devout members.

Corporate Restructuring. In the 1980s, companies began to become 'lean and mean' by trimming all excess 'fat' (usually employees and often senior high-wage employees). Bloated bureaucracies and tall hierarchical arrangements were restructured as sleeker, flatter organizations. 'Slimmed down', less bureaucratically organized firms, their advocates believe, are more productive.

The productivity crisis, however, continued to vex the corporate community. It is said that during periods of crisis, ruling classes seek to reorganize and restructure social institutions. Having restructured *themselves* by the mid-1980s (with little to show for it), corporate elites turned their attention to *other* institutions, hoping to improve their new work force, thereby improve their productivity and their competitive capacity in global markets. Public education became an important target.

Renewed Interest in Educational Reform

Corporate leaders' perceptions of the need for their involvement in educational reform were heightened by the publication of the US government paper *A Nation at Risk* (National Commission on Excellence in Education, 1983). The report confirmed cocktail party fears and tapped into pent-up business concerns about public education. The report insisted that there are strong links between the economic decline of the United States and (allegedly) weak public schools.

At about the same time, President Reagan and Secretary of Education Bell spoke out strongly in favour of increased business support to education as a way to compensate for decreased public financial support and cuts in federal spending for education. The federal contribution to elementary and secondary education dropped from 8.7 percent to 6.2 percent of the total expenditure from 1981 to 1989, and the proportion of the U.S. federal budget for elementary and secondary education dropped from 2.5 percent to 1.8 percent during the Reagan years. Reagan charged that federal aid to education had failed (both as a help to children and as a policy) and that businesses and the states should expand their leadership in education.

New Workers and the Competitiveness Problem

In the USA (though not in New Zealand or Australia) a labour shortage moved into the forefront of corporate leaders' concerns in 1987. This labour shortage has important implications for understanding corporate leaders' frustrations about the labour force. As was the case during the World War I years, relatively tight labour markets weaken employers' ability to manage and control employees.

> "...To insist that schools transmit...punctuality, neatness and civility."

The low unemployment rate made the national business community uncomfortable, particularly about low-wage jobs. Company owners were forced to hire those who had been previously labelled unemployable. Their perception of the situation may be summarized as: 'Not only is the product of the educational system defective, there is a shortage of it.'

More recently, projections of the work force in the near future began to disturb the business community even further. The widely cited report by the Hudson Institute in 1987 estimated that by the year 2000, 83 percent of the new work force would consist of minorities, women, and immigrants. This type of work force is regarded as a problem because of the 'deprived backgrounds and low education levels that characterize a disproportionate number of these employees'. This is not the labour pool from which businesses wish to hire. Simultaneously, reports about education began to emphasize the 'children at risk'. A careful reading of this material shows that a new perspective was gaining currency. It was not the *schools* that needed to be restructured and reformed but *particular youngsters in them*, specifically white and minority working-class and low-income students who are most likely to drop out of school or who will have 'flimsy' high school diplomas. The blame for U.S. capitalists' weakness in world markets was placed increasingly on working-class and low-income students. These youths, it is claimed, later become undisciplined and unmotivated workers because their parents and the schools allegedly failed to socialize them to be disciplined and motivated.

> “...Noteworthy, because of its absence, was the possibility that the business community has played a role in the expansion of poverty and poor behaviour.”

So we see 'think tanks', the popular and business media, and the Reagan/Bush U.S. Education Department beginning to insist that schools transmit democratic values, citizenship values, and workplace values, especially those which include 'punctuality, neatness, and civility'. Education must shape and modify acceptable and appropriate social and academic behaviour. They point to the loss of traditional values among at-risk youngsters because of single parent families, working mothers, poverty, and drug usage. There is (allegedly) inadequate parental socialization and schools must take over family-like roles to nurture the growing number of children and fill the gap left by working mothers. Thus, because the 'ideal family has disintegrated', the schools must instil values, goals, and discipline.

These expressions harken back to 1910, when a superintendent of the Chicago schools asserted: 'We must realize from the start that the moral reformation of the child is more important than the sharpening of his intellect'.

Corporate restructuring was the model used to justify the reduction and decentralization of school district bureaucracies. School reform agendas that call for clearly defined values in schools are kin to the corporate-culture model.

A Case Study

The national-level discussions and debates about school reform eventually filtered down to the state and municipal levels. At the local level, the concern about deficits in discipline and motivation was pronounced.

The **Charlotte, North Carolina, Chamber of Commerce Task Force on Education and Jobs** began its work in 1987 and continued through to July of 1988. Its members included local (and a few regional and state) business leaders, educators, elected officials, and civic notables. Its formal mission was to identify the work-force needs of the business community, assess the extent to which the schools were meeting these needs, and propose reforms. Collecting data for our case study we attended all meetings of the Task Force and its Business Subcommittee; kept field notes and interpretive journals; and collected and analyzed the Task Force's documents, reports and surveys. We recorded in-depth interviews with key members of the Task Force. In 1990 we conducted two-to-three-hour interviews – also taped and transcribed – with policy analysts in government, research institutions, and public-interest organizations in Washington, DC, and Boston.

Our field notes show that the business leaders' primary concern was the poor behavioural and attitudinal traits of young workers and that the latters' level of academic skills was of secondary concern. At first the members of the Task Force defined the problems facing the local business community as resulting from public *education*. Later, they altered the definition to claim that the major problem was low-income and working-class white and minority *students*, not the schools nor even weak education. They concluded that the educators' essential task was to reform and modify these students.

During the first Business Subcommittee meeting, the members complained about new workers' lack of maturity, reliability, and failure to arrive at work on time and only incidentally mentioned the workers' poor 'educational qualifications'. A few weeks later, others spoke far more strongly: kids seem to think they can get rich quick; there's a lack of motivation that's not being taught; they need to learn to do what people tell them to; [schools] need to reinstate the value system; [workers] need to do more than just be there; kids need social discipline that understands and respects authority; it's like they have their own union because they can just go down the street and get another job.

Educators on the Task Force, joined by state education officials and the (then) former governor of North Carolina, James Hunt, asserted that the schools were not the cause of the problems the business leaders described. Rather, they argued, the poor discipline and motivation were due largely to inadequate and uninterested parents who fail to socialize their youngsters properly. 'You are getting the lowest of the low; these children simply don't have the work ethic'. Disadvantaged youngsters 'are creating the chaos in our schools ... it is the lack of parental involvement that gives education all of its problems... [These youngsters drop out] and diminish the quality of life for everyone.'

> “...The company becomes quasi-sacred... with its members transformed into devout members.”

All the Task Force members eventually agreed that low-income *parents* are at the centre of the poor discipline and motivation exhibited by students at school and later at work. They linked the problem with poverty, and concurred that poverty is expanding locally and nationally. Then they attributed the rise in poverty to individual behaviour and life-styles: teenage mothers, single-parent families, illiteracy, and drug usage.

Noteworthy, because of its absence, was the possibility that the business community has played a role in the expansion of poverty and poor behaviour. Not one member linked the increasing rates of poverty or the lack of motivation and discipline among non-college-bound youths with the kinds of jobs that companies have eliminated and created over the past several years. Instead, members from all sectors of the local community repeated the popular nationwide claim that the new 'high-tech, information-age' economy would supply numerous good jobs if only young people would stay in high school and graduate with 'better' diplomas.

The High-tech Society

In addition to the current accepted wisdom that schools must create better educated workers so corporations can compete effectively in global markets, many argue that such workers are necessary to match the rapidly growing number of new *high-tech* jobs. The alleged mismatch is asserted to be yet another reason for the weak competitive performance of firms. Variations of this theme flourish in the popular, business, and academic press. We heard versions of it several times during our case study, and they were repeated by the national policy analysts and educational reformers we interviewed in 1990.

The theme implies the widespread availability and expansion of sophisticated, complex jobs requiring a solid academic background. Mainstream social scientists, for instance, assert that 'as technical sophistication and the complexity of tasks steadily increase, the educational requirements of the economy should expand'. Critical social scientists added: 'New attempts are needed to upgrade schools in ways that can better match jobs and potential employees ... mass education fails to prepare [students] for life in the information age'.

Although most business leaders, policy analysts, social scientists, and educators seem to accept that technological innovation is pervasive and usually requires new and more sophisticated skills from wage earners, there is no consensus on this issue. Rather, there is a heated academic debate over whether most new workers are under-skilled and under-educated for new high-skill jobs or whether jobs are being deskilled (simplified) and new workers need fewer skills for current and future jobs.

The contrasting views in the debate fall roughly into two camps. The first camp claims that the work force is under-skilled at the middle- and lower-level positions and that high-skill jobs are expanding. *Business Week* reported, for example, that Motorola now has a production method that uses complex mathematical guides to manage quality. This work is currently done by engineers, but the company wants to 'save money' by having blue-collar workers do part of it. They will need 'proved' maths skills.

This kind of 'upskilling', which attempts to save money by eliminating high-priced employees, will increase as a method of improving competitiveness, productivity, and profits. There is however no evidence that it will open opportunities for advancement or raise wages for the lower-waged.

The second camp in the debate holds that the work force is over-educated, particularly at the middle and lower levels, and the emerging job opportunities will require less-educated workers. More than a few researchers have found little evidence to support the contention that technological change requires more sophisticated education or workers. Moreover, some authors have suggested that the proliferation of high-tech industries is more likely to reduce the skill requirements of jobs, rather than upgrade them.

In 1990, just 5 percent of business people surveyed said that educational and skill requirements are increasing in the workplace. The Bureau of Labour Statistics says that approximately one-third of jobs require an eighth-grade (Australia: Year 8; New Zealand: Form 3) education, one-third require a tenth-grade (New Zealand: Form 5) education and some additional training, and one-third require four or more years of college.

Similarly, Reich (now President Clinton's Secretary of Labour) identified three major categories. (1) *Routine production services*, (which include heavy industry but also many information-processing jobs) were held by about one-quarter of the American work force in 1990. These workers' educational requirements are basic literacy and the ability to perform simple computations, but their 'cardinal virtues are reliability, loyalty, and the capacity to take direction'. (2) *In-person services*, which accounted for 30 percent of the jobs in 1990, is growing the most rapidly. Its incumbents need 'at most' a high school diploma and some vocational training. (3) *Symbolic-analytic services*, which require at least four years of college and accounted for 20 percent of American jobs in 1990.

Predictions about the quantity of new high-tech jobs vary. The estimate of John Clendinin, chief executive officer of Bell South, is the most optimistic: in the next few years 'there will be 10 million information age jobs'. A Bureau of Labour Statistics report, however, showed that although 23.4 to 28.6 million new jobs will have been created between 1982 and 1995, only 1.0 to 4.6 million will be in high-tech industries (which is not the same as saying that they will all be high-tech jobs). *Business Week* estimated that from 1986 to 2000 the largest *number* of new jobs (6.2 million) will be for retail salespersons, waitresses-waiters, nurses, janitors, general managers, cashiers, truck drivers, office clerks, food counter workers, and nurse aides. The fastest-growing jobs will be medical assistants, physical therapists, physical therapist aides, repairers of data-processing equipment, home health aides, systems analysts, medical records technicians, employment interviewers, and computer programmers; yet they will account for only 1.1 million new jobs.

> "...It was not the *schools* that needed to be restructured, but *particular youngsters in them...*"

Although some of these jobs require solid training beyond high school and some may be considered high-tech, a far larger proportion do not fit these descriptions. For instance, the economy is generating nine new cashiering jobs for every computer programming job. The usefulness of occupational forecasting for guiding educational reform is severely limited, and has certainly not been used by the business community.

In general, business leaders' demands for a better-educated work force to match the high-tech information age do not take into account whether businesses really require such workers or how many they will actually need. Moreover, it does not follow that merely because a new technology is sophisticated, the education that workers need to interact with the technology must necessarily be more advanced. Changes in skills may occur, but levels of skills may not increase. Finally, upskilling is often accompanied by decreased wages.

Corporate Restructuring

Job Losses in the 1980s

Although technological innovation has captured the attention of educational reformers and analysts, other changes, especially changes in the labour market wrought by corporate restructuring since the 1980s, have had more dramatic effects on young people who are not going on to tertiary study. First, the industrial and entry-level jobs with core firms that these students traditionally entered (and in which they could expect a modicum of training, upward mobility, stability, and good annual wages) are disappearing rapidly. The 500 largest U.S. industrial companies added no jobs from 1975 to 1990, and their share of the civilian labour force dropped from 17 percent to 10 percent in that period. Moreover, Fortune 500 companies eliminated 3.1 million jobs from 1980 to 1987. Other analysts have reported that almost 2 million manufacturing jobs were cut from 1979 to 1986 and that 600,000 to 1.2 million middle- and upper-level executives lost their jobs from 1983 to 1986. Overall, the U.S. Department of Labour estimated that from 1980 to 1985, 11 million workers lost their jobs through plant closings and massive layoffs. Together these losses mean a diminished supply of jobs **and** rungs on job ladders.

Among the 11 million people who lost jobs, 55 percent had to move downward. In 1986, of every 10 displaced workers, 3 found jobs in which they earned the same or more than previously, 3 found jobs where they earned less, and 4 stayed unemployed. As the jobless desperately took jobs beneath their skill and educational levels, they made it look as if the jobs into which they plummeted required the skills and credentials they had. Thus, the credential-laden victims of corporate restructuring may have exacerbated the questionable demands for more solidly educated, highly trained workers in general.

Analysts have suggested that even if all the young people in the country were to complete a community college programme, there will not be enough jobs awaiting them. However, most researchers, and certainly lay observers and policymakers have hesitated to investigate this seriously. In the next sections we will try to find an answer to the question of 1910, 'Here are our children: what kind of industry do you have to offer?'

Corporate Destructuring

The broad and heavy emphasis on *technology* innovation both obscures and neglects the *social* innovation undertaken by corporate elites in externalizing work (sending work formerly done in the firm to outside contractors). Although corporate restructuring seems to be organizational innovation, involving the shifting, adjusting, making flexible and externalizing of functions, these functions are still carried out, and carried out by people. And thousands of these people are the victims of the restructuring.

> “...Employers purchase cheap flexible labour but ways to discipline or control workers disappear.”

Many of the new jobs created since 1980 are in the small-business sector of the economy, are contingent jobs, and feature short or nonexistent career ladders. Rather than corporate restructuring, we suggest that *destructuring* is a more appropriate term. The hardships for those who must move and change careers, many times at a loss of pay is real and growing. Small businesses typically have low wages, instability, or 'volatility' and lack opportunities for training and upward mobility. They provide few benefits and are likely to perish. Just as important, jobs in small businesses are frequently part time or temporary-contingent.

The Functions of Contingent Workers

Temporary and part-time workers have long been a part of the U.S. workplace, and their numbers usually increase during economic downturns and decrease once the crisis passes. Following the 1981-82 recession, however, their numbers **increased**. Probably the most accurate estimate is 28 to 35 percent of all workers in the United States.

A contingent work force is necessary, its advocates argue, to keep the economy competitive. The increase in the number of these workers is frequently an aspect of corporate restructuring.

Contingent or 'disposable' workers can be a buffer against market fluctuations, and they save employers the cost of benefits, pension plans, wages, and the expenses associated with internal job ladders. Moreover, these disposable workers are vivid examples to all corporations' core-workers of the work life they may confront if they do not labour in a motivated, disciplined fashion. Contingent workers also give employers the kind of economic leeway that is necessary to continue to offer handsome wages and perks to the core employees whom they wish to retain. Finally, contingent work minimizes the possibilities of the formation and activism of unions because the workplace and work teams are constantly in a state of flux.

> “...The economy is creating nine new cashiering jobs for every computer programming job...”

Sixty-five percent of the approximately 17 million new jobs created from 1980 to 1988 pay less than $11,000 a year. The problem, especially for young workers, then, is not just fewer jobs but the loss of a decent income because of the low wages and instability of the new jobs that are available. The enhanced flexibility for employers has generated increased poverty for workers and school leavers and there are twice as many female and minority workers as white males in contingent work. Not only have millions of industrial jobs been replaced by low-mobility, low-paying jobs in the volatile small-business sector, but the expansion of contingent jobs in all sectors of the economy has contributed to destructured, unstable labour markets. The restructuring of companies has had consequences that the fashioners of restructuring did not foresee.

The Contradictions of Restructured Work

Former U.S. Secretary of Labour Elizabeth Dole argued that high school students must be taught to make the connection between staying in school and their future job possibilities, she said there is a 'motivation gap' among students. Dole and others, however, do not take into account the possibility that school leavers *do* make the connection between a high school diploma and job opportunities and what they frequently observe fails to encourage them to be disciplined or motivated in school or at work.

Undisciplined, Unmotivated Students

The effects of low wages, no benefits, and a lack of opportunity – and how these factors intersect with schooling by race, ethnicity, and gender – deserve analysis. Today, non-tertiary-bound youths believe, realistically, that as adults they will face jobs that are unstable, lack opportunities for advancement, pay low annual wages, and provide few, if any, health benefits.

These students' observations are correct. The annual earnings of high school graduates aged 20-24 fell from $15,221 to $10,924 from 1973 to 1986. Decreasing and uncertain wages are a signal to youths that the business community does not value a high school diploma, and new workers view the available jobs as both menial and meaningless. Both schooling and markets have lost their credibility. High school students, although repeatedly taught that the key to good jobs and upward mobility is to do well in high school, are increasingly unable to see – in the world around them – success stories in lives of their neighbours, peers, and kin who are high school graduates. Often they resist the 'achievement ideology' because to embrace it means that they would have to think of their parents as stupid and lazy, or weak and unambitious. Thus, the dearth of secure jobs with decent pay, stability, and opportunities partially debunks the ideology and rhetoric that education will lead to good jobs. This, however, is just the first contradiction fostered by corporate restructuring.

Undisciplined, Unmotivated Workers

The social restructuring and destructuring of firms has created new social arrangements in the workplace. These new arrangements have generated unanticipated consequences for corporate leaders. The relationship between volatile, undisciplined labour markets and undisciplined workers should be analysed.

Elaborate incentives and intense socialization into a corporation's culture are used to integrate employees emotionally and socially into 'the company', but destructuring generates the opposite tendency – social disintegration. The potential contradiction, then, is that the benefits that a corporate culture may possess (as a disciplinary and motivational technique) are nullified by the restructuring.

Under the new restructured conditions, the discipline and motivation of contingent workers are hindered as well. Contingent workers have little understanding of the firm or its purpose and are not interested in the long-term goals of the organization's leaders. The unstable nature of the jobs affects the productivity of contingent workers who may labour with less-than-passionate effort. It is argued that markets will discipline contingent workers, but they may simply choose to opt out motivationally, if not physically.

Core employees, for instance, have little incentive to share their knowledge and skills with temporary workers for fear of undermining their own job security; such withholding harms productivity. Loyalty, indeed, decreases at all levels as core employees become increasingly anxious about the stability of their jobs. The passion and commitment that creates greater productivity diminishes.

The externalization of workers means that employers purchase cheap, flexible labour but the typical ways to discipline or control contingent workers disappear. In fact 'a further expansion of an insecure, casual, poorly trained and cheap employment periphery is the last thing needed to increase productivity'. If contingent work causes contradictions for business owners, the consequences for young workers are more troubling.

Effects on Youths of Unstable Jobs

An advocate of contingent work praised the new 'dynamic economy propelled by workers who haven't put down roots'. Years of rootlessness, however, take their toll on young workers. The president of the American Federation of Teachers in 1990 expressed his dismay that even high school graduates who did well in their studies usually cannot hope to obtain a good stable job until they are at least in their mid-20s. These several years of floundering in unstable jobs, punctuated by periods of unemployment, lead to the loss of self-confidence, to cynicism, often despair, and to a chronic sense of insecurity for the approximately one-half of U.S. high school graduates who do not attend college. Moreover, the inability to obtain steady work tends to make the young entrants less attractive and even 'tainted' to potential employers and may lead to their being permanently marginalized.

Unstable jobs, volatile labour markets, and uncertain and low wages may shape orientations and traits that redound on the performance of tasks and appear as a lack of motivation and discipline. Another contradiction of the new 'casualization' of labour then, may well be attitudinal, intellectual, and often physical disengagement from school and young workers uninterested in available jobs. Do unsatisfactory workers wind up in bad jobs or bad jobs foster unsatisfactory work habits? Is it the task of the schools to break the loop, to socialize young people into contentment with bad jobs? Or is it the task of employers to provide good jobs which will motivate good work habits? Or is it the task of the nation, via government intervention, to break the loop?

Discussion

High school leavers are active agents in their social processes; they experience, and make sense, of their worlds. High school students read reality with more care than they read textbooks. Part of their world is the realm of work, not only because many high school students hold jobs and observe high school graduates in those jobs, but because they observe their adult kin grappling with the financial difficulties fostered by restructuring and the decreased wages in many kinds of jobs. Work is rarely considered an agent of socialization or in the same category as family, education, religion, or the mass media, yet the fundamental and rapid transformations of work opportunities are clearly a part of the socialization process of adolescents.

> "...It is not clear that top officers of major corporations are aware of the dearth of promising entry-level jobs."

The current 'education deficit' and 'motivation gap' come from sources beyond schools or inadequate parents. The emphasis on 'weak' (often low-income) families or weak schools fails to explain the deficits in motivation and discipline of U.S. high school students and new workers who do not go to college.

We have tried to show that other sources, slimmed-down companies, for example, have significant effects on educational motivation and discipline by increasingly polarizing the economy, thereby decreasing annual wages and the rewards of a high school diploma. The current economic crisis was not caused by education, but has had significant effects on the educational processes and outcomes of non-college bound students.

Conclusion

In the past several years, business leaders, encouraged by governments, restructured their firms to enhance their ability to compete internationally. The social and economic consequences to workers of restructured work and jobs may have unintentionally fostered or exacerbated the so-called education crisis, characterized by youths who do not perform as disciplined and motivated students and employees. Business leaders' solutions to a perceived economic crisis have promoted a crisis of social integration.

The corporate community's strategy of marginalizing and externalizing work and workers undermines and impairs a necessary condition of production – disciplined and motivated labour.

We have sought to link the current school reform movement to restructured labour markets and their consequences for high school students and new workers. We are not convinced, however, that corporate leaders' demands for reform are simply attempts to scapegoat the schools. It is not clear, for example, that the top officers of major corporations are aware of the dearth of promising entry-level jobs. Frederick Edelstein, of the National Alliance of Business, told us that 'Chief Executive Officers need to be educated' about the realities of labour markets for youths. Similarly, Harold Howe II, former U.S. commissioner of education, said in 1990, that he had 'been going around rattling cages' to encourage the business community to create better jobs.

The business community, however, does not examine its own policies and activities as possible sources of the crisis. Instead, corporate restructuring is praised as successful, and it has become one model for contemporary school reform efforts. But corporate restructuring has generated further chaos and uncertainty in the economy and in society and implies instability and insecurity. Do educators face the task of adjusting people to long-term uncertainty? Is that the role of schools and teachers? Is that education?

Whatever policies are implemented, school reforms of any kind are unlikely to succeed if school leavers cannot see ahead of them rewards for diligent efforts in school. Employers will not find highly disciplined and motivated young people looking for jobs that are unstable and low paid. Restructuring schools and restructuring students without attending to the contradictions generated by a restructured crisis-prone job market are unlikely to solve business leaders' problems with global competitiveness.

Notes

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A longer article on this topic with much more extensive references is to be found as

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The High-tech Society

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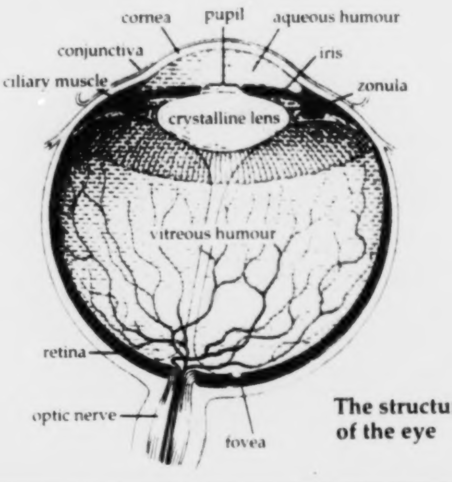
The Process of READING

David Crystal

IT MIGHT BE THOUGHT DESIRABLE, before beginning an account of written language, to present an anatomical and physiological description of the visual and manual systems in human beings. However, this is not usually done in linguistic discussions of reading and writing because there is so little that can be said in our present state of knowledge. The study of what happens when language is visually perceived and processed is very recent, and while a certain amount is now known about the likely processing operations involved, the neuroanatomical correlations of these processes remain obscure. Moreover, there is perhaps little in principle that *can* be said, given that the structures of the eye and hand do not seem to be biologically adapted for written language in the way that the vocal organs are for speech (though, given the relatively recent development of writing, this is hardly surprising). As a result, the bulk of the enquiries are carried out by psychologists concerned less with the structure and function of the eyes, and more with models of the 'deeper' ways in which the brain works when it processes written language.

Eye Movements

One physiological topic has attracted considerable attention, however: the nature of eye movements. These movements can be recorded using various techniques, such as by attaching a mirror to a contact lens placed on the cornea; it is then possible to film a beam of light reflected off the mirror. (See also the computational technique described below.) Using such methods, researchers have shown that the eyes work together, and that when searching for an object they move in a series of rapid jerks, known as *saccades* (from French, 'the flick of a sail'). Between each movement there is a period of relative stability, known as a *fixation*. During reading, the eyes do not follow lines of print in a smooth linear manner but proceed in a series of saccades and fixations. We usually make 3-4 fixations a second, though rate and duration can be affected by the content of what is read, and there are some interlanguage variations.



The structure of the eye

What happens during a fixation is of particular importance in studying the process of reading. The nerve cells that convert light into electrical pulses are located in the *retina*, at the back of the eye. The central region of the retina, where these receptor cells are packed closely together is known as the *fovea*. It extends for some 2° of visual angle, and is the area that gives the best visual detail, such as is required for identifying graphic forms. The further a stimulus is from the fovea, the poorer our ability to discriminate. The *parafoveal* area surrounds the fovea, and this in turn is surrounded by the *periphery*. These areas are less involved in the act of reading, but they do have some relevance in the detection of larger visual patterns in a text.

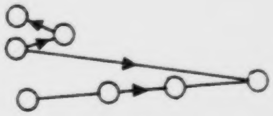
Perceptual Span

How much linguistic material can be seen during a fixation? Most information about visual perceptual span comes from using a tachistoscope: subjects are presented with a briefly flashed sequence of letters or words, and are then tested to see how many they recall. In a single exposure of 1/100 sec, it is usually possible to recall 3-4 isolated letters or 2-4 short words. Several factors affect subjects' performances, such as the distance of the stimuli from the eyes, or whether the letters or words are linguistically connected.

However, this approach does not replicate what actually happens in reading, where people make several fixations a second and do not have to name what they have seen. Accordingly, several other methods of studying perceptual span have been tried. One sophisticated study involved the use of computer technology (Rayner, K. and McConkie, G.W., 1977). An eye-movement monitor illuminated the eye with invisible infra-red light, and measured the amount of light reflected from certain parts of the eye's surface. A computer was then attached to this equipment and programmed to check the eye position 60 times a second, keeping a record of where the person was looking and how long each movement or fixation took. The text to be read was displayed on a screen, also under the control of the computer, thus enabling the researchers to make

A Sequence of Eye Movements

Fixations are shown as circles, and the order of movement is shown by arrows; information about the duration of each fixation is not given. In the fixations for the sentence 'The vehicle almost flattened a pedestrian' given here, the reader spends most of the time at the beginning of the sentence. Note (i) that the word *a* does not receive a separate fixation (and possibly nor does *the*); (ii) the first part of the sentence is looked at three times. Effects of this kind require a complex explanation, in which physical features of a text (such as word length) interact with its semantic properties.



changes in the display during the period of an eye movement.

In one experiment, a piece of text was 'mutilated' by replacing each letter with an *x*. When subjects looked at this display, the computer automatically replaced the *x*'s within a certain region around their point of central vision with the letters from the original passage. This created a 'window' of normal text in the subject's foveal region for that fixation. When the subject's eyes moved, the old window was replaced by *x*'s and a new window was created. The size of the window was under the control of the researcher: in the table, a window of 17 characters is shown. Subjects had no difficulty reading under these conditions, unless the window became too small.

By using different window sizes and mutilating the text in different ways, it was possible to drawn various conclusions about perceptual span. Reducing the window size slowed the subjects' reading speeds but it did not affect their ability to comprehend the text (even if all the reader could see was nine letters – little more than a word at a time). The study suggested that subjects were using letter information no further than 10 or 11 positions from their centre of vision, though information about word-length and general shape could be obtained from further away. A follow-up study also showed that these regions were not symmetrical around the centre of vision: on the left side, the area used during a fixation was restricted to four letter positions.

It is possible to conclude that, when looking at a text of average type size about 30cm away, readers do not usually identify more than two or three short words (about 10 letters) on each fixation. Larger units cannot be seen 'all at once'.

Theories of How We Read

Following a fixation during reading, a visual pattern of graphic features is conveyed to the retina, and then transmitted via the optic nerve for interpretation by the brain. The stages involved in this process are not well understood, and several different theories have been proposed to explain what happens when fluent readers read. One reason why the field is so controversial is that it is extremely difficult to obtain precise information about the events that take place when people read. In fact, very little actually seems to happen, apart from the eye movements – and these do not begin to explain *how* the reader is managing to draw meaning out of the graphic symbols. Similarly, if people are tested after they have read something, we may find out something about *what* they have read, but not about how they read it. Nor are experimental situations necessarily convincing, because they make readers do abnormal things. And analysing the behaviour of people with reading handicaps may produce results that do not apply to healthy readers.

Joint Reading

Smith has taught himself to read Russian letters, but he hasn't had time to learn the language. Bronski was brought up speaking Russian, but he never learned to read. One day, Bronski gets a letter in Russian from a relative. He cannot read it. He shows it to Smith. Smith cannot understand it. But all is well: Smith reads the words aloud; Bronski recognizes them, and interprets them. He is happy. But who is 'reading'?

Given the difficulties, the field of reading research would not seem to be a particularly promising or attractive one. It is, however, an area that has attracted many investigators, partly by virtue of its very complexity, and partly because any solutions to the problem of how we read would have immediate application in areas of high social concern. A large number of children have great difficulty in learning to read, and many never read well. Estimates suggest that between 10% and 20% of the U.S. population are functionally illiterate. Such figures thus bring a sense of urgency to reading research.

'Reading' in all of this does not mean simply 'reading aloud', which might be done by a suitably equipped automatic machine that would not know what it was saying. 'Reading' crucially involves appreciating the sense of what is written: we read for meaning. It is this link – between graphology and semantics – that has to be explained by any theory of reading.

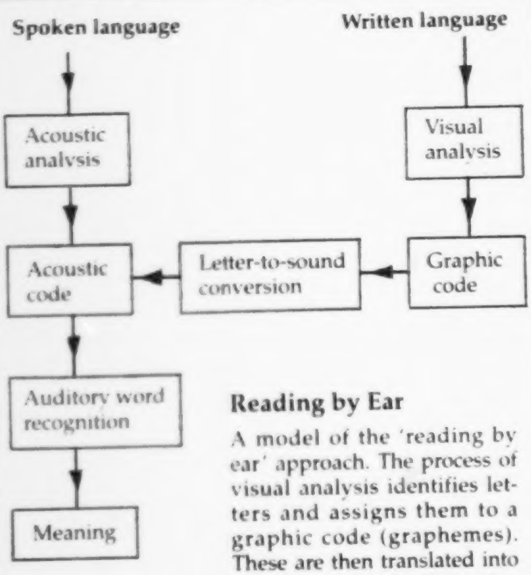
Fixation Windows

A line of text on four successive fixations, using Rayner and McConkie's technique. Each window area is 17 letters wide – that is, eight letter positions to the left of fixation and eight to the right.

Fixation number	Text
1	Xxxxhology means perxxxxxxxx xxxxxxxxx xxxx xxxx xxxxxxx Xxxx xx x
2	Xxxxxxxxxxxxxxs personality diaxxxxxx xxxx xxxx xxxxxxx. Xxxx xx x
3	Xxxxxxxxxxxxxxx xxxxxxxxxxx xiagnosis. from hanx xxxxxxx. Xxxx xx x
4	Xxxxxxxxxxxxxxx xxxxxxxxxxx xxxxxxxxx xxxm hand writing. Xxxx xx x

Reading by Ear or by Eye?

Most people have encountered the struggle that takes place as a child is learning to read. A major feature of this task is that words and letters are 'sounded out'. It is as if reading is possible only if the symbols are heard – reading 'by ear'. One theory of reading therefore argues that a phonic or phonological step is an essential feature of the process – a theory of 'phonic mediation'. The view implies that reading is a serial or linear process, taking place letter-by-letter, with larger units gradually being built up.



Reading by Ear

A model of the 'reading by ear' approach. The process of visual analysis identifies letters and assigns them to a graphic code (graphemes). These are then translated into an acoustic code (letter-to-sound conversion), at which point the process links up with the processing system required for speech. The auditory patterns are then recognized as words and semantically interpreted.

The alternative view argues that there is a direct relationship between the graphology and the semantics, and that a phonological bridge is unnecessary (though it is available for use when reading aloud). Words are read as wholes, without being broken down into a linear sequence of letters and sounded out – reading 'by eye'. Readers use their peripheral vision to guide the eye to the most likely informative part of the page. Their knowledge of the language and general experience helps them to identify critical letters or words in a section of text. This initial sampling gives them an expectation about the way the text should be read, and they use their background knowledge to 'guess' the remainder of the text and fill in the gaps. In this view, a text is like a problem that has to be solved using hypotheses about its meaning and structure.

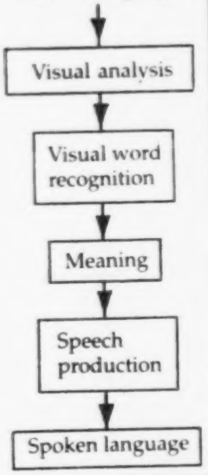
The arguments for and against these views are complex and multifaceted, deriving from the results of a vast number of experiments on aspects of reading behaviour. Some of the points that have been raised are summarized below.

Support for the Ear

- Associating graphemes and phonemes is a natural process, which cannot be avoided when first learning to read.
- Letter recognition is very rapid – about 10-20 msec per letter – which is enough to account for average reading speeds (around 250 words per minute). These speeds are similar for both silent and oral reading (though the latter is slightly slower, presumably for articulatory reasons), and are close to the norms for spontaneous speech.
- Statistical studies of word frequency show that most words in a text are of very low frequency, several occurring only once over long periods; some will be completely new to a reader. Readers can therefore have few expectancies about such material and will need to decode it phonologically. It is an everyday experience to break new long words up into phonemes or (more usually) syllables: try *picomalesefeso*, and see.
- When people read difficult material, they often move their lips, as if the phonology is needed in order to help comprehension. There may be other sub-vocal movements not so far observed.

Reading by Eye

A model of the 'reading by eye' approach. The process of visual analysis identifies letters and assigns them to a graphic code (graphemes). The visual patterns produced are recognized as words and given a semantic interpretation. The semantic code stored in the brain may then be used to activate an associated acoustic sequence of events, should this be needed (as in reading aloud).



- It is difficult to see how the 'eye' theory can handle the many variations in type and handwriting. Yet we are able to read these variations quite rapidly, even in experimental situations (using such forms as *BoAt*).
- Reading by eye would be a very complex matter. Each word would have to be given a separate orthographic representation in the brain, along with a separate retrieval process. This is not a parsimonious explanation.

Support for the Eye

- Fluent readers are not confused by such homophones as *two* and *too*. Phonology cannot help in such cases. Moreover in words like *tear*, there is no way of deciding which pronunciation is involved (/tiə/ or /tɛə/) until *after* the reader has selected a meaning.
- In one type of reading disorder ('phonological dyslexia'), people lose the ability to convert isolated letters into sounds; they are unable to pronounce even simple nonsense words, e.g. *pob*). But they *are* able to read real words, showing that a non-phonological route from print to meaning must exist.
- The 'ear' theory does not explain how some people can read at very rapid speeds, which can be in excess of 500 words per minute. The eyes can take in only so many letters at a time. Rapid reading poses less of a problem for the 'eye' theory, as it simply requires that readers increase their sampling as they speed up.

- In brief exposure experiments, people identify whole words more rapidly than isolated letters. For example, if subjects are shown BAG, BIG, A, I, IBG, etc., and asked whether they have just seen A or I, they perform best with the familiar words. This is the 'word superiority' effect.
- The fact that different sounds are written identically, and different letters can have the same pronunciation, complicates a phonological view. Also, some orthographic rules seem totally unrelated to the phonology, e.g. *skr-* is acceptable in English speech, but does not occur in normal writing.
- Some higher-order processing must be involved in reading, because of several observed effects. Experiments have shown that it is easier to recognize letters in real words than in nonsense words. Typographic errors are often not noticed when reading through a text (the proof-corrector's problem). Errors made by fluent readers while reading aloud are usually syntactically or semantically appropriate; they make few phonologically induced errors.

Compromise?

It is evident that neither approach explains all aspects of reading behaviour; it is likely that people make use of both strategies at various stages in learning and in handling different kinds of reading problem. The 'ear' approach (sometimes referred to as a 'bottom-up' or 'Phoenician' theory, because of its reliance on basic letter units) is evidently very important during the initial stages. Perhaps after several exposures to a word, a direct print-meaning pathway comes to be built up. But the 'eye' approach (sometimes referred to as a 'top-down' or 'Chinese' theory, because of its reliance on whole-word units) is certainly needed in order to explain most of what goes on in fluent adult reading.

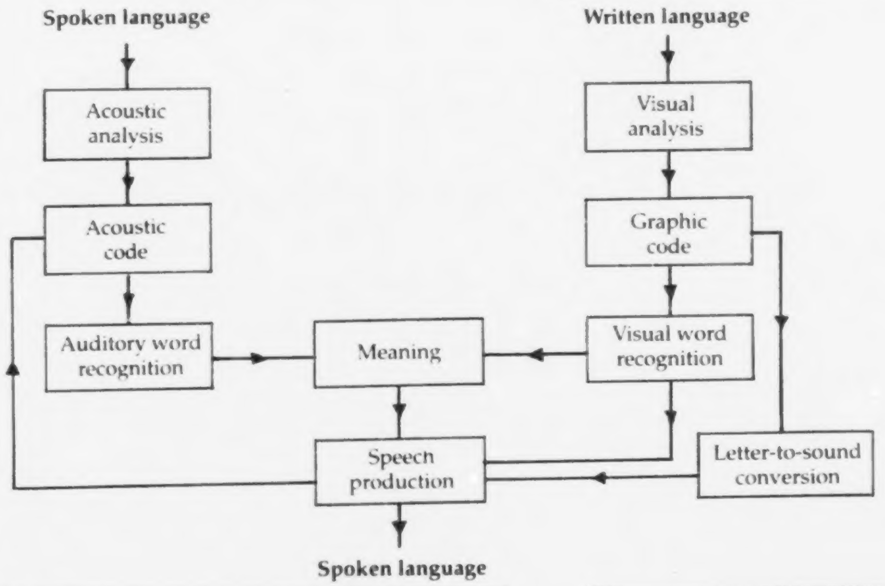
It should be noted that some of the arguments that come to mind, in relation to this issue, do not clearly support either theory. For example, it has been argued that people who have been profoundly deaf since birth, and who subsequently learn to read, provide clear support for the 'eye' theory; in their cases a phonological bridge cannot be available. However, the fact that such people do have great difficulty in learning to read could be interpreted to show the importance of phonological mediation after all. Similarly, the existence of Chinese and Japanese *kanji* is sometimes proposed in support of the view that a phonological stage is unnecessary. But here too the evidence is ambiguous. Logographic systems seem to be difficult to learn, with few users mastering more than about 4,000 symbols out of the 50,000 or so which exist. On the other hand, very little is known about the orders of difficulty that are encountered in learning *kanji* symbols, and the degrees of expertise that exist in using logographic systems.

As with most major theoretical oppositions, elements of both approaches are required to explain the experimental findings. As a consequence, several 'compromise' models have been devised, which integrate the main features of both 'ear' and 'eye' theories. Some of these models are extremely complex, postulating a large number of components and pathways, but this is only to be expected. Despite the clear visual signals provided by the written medium, learning to read is a complex process, and only an appropriate sophisticated theory will explain it.

A Combined Model

This incorporates some of the findings from the experimental work referred to in this section. It is based on the approach of the British psychologist John Morton (1933-), but it ignores several detailed features of that model (especially on the output side) and does not use his distinctive terminology, in which the units of word recognition and production are referred to as *logogens*.

1. Familiar words are visually analysed, recognized, and assigned a meaning. Their spoken form may be retrieved from the speech-production system, which may be activated by the meaning (reading with understanding) or by the visual patterns directly (reading without understanding).
2. Unfamiliar words are visually analysed and may then be analysed phonologically (letter-to-sound conversion). The resulting sound pattern can be referred back to the auditory word-recognition system, to see whether it 'rings a bell'.



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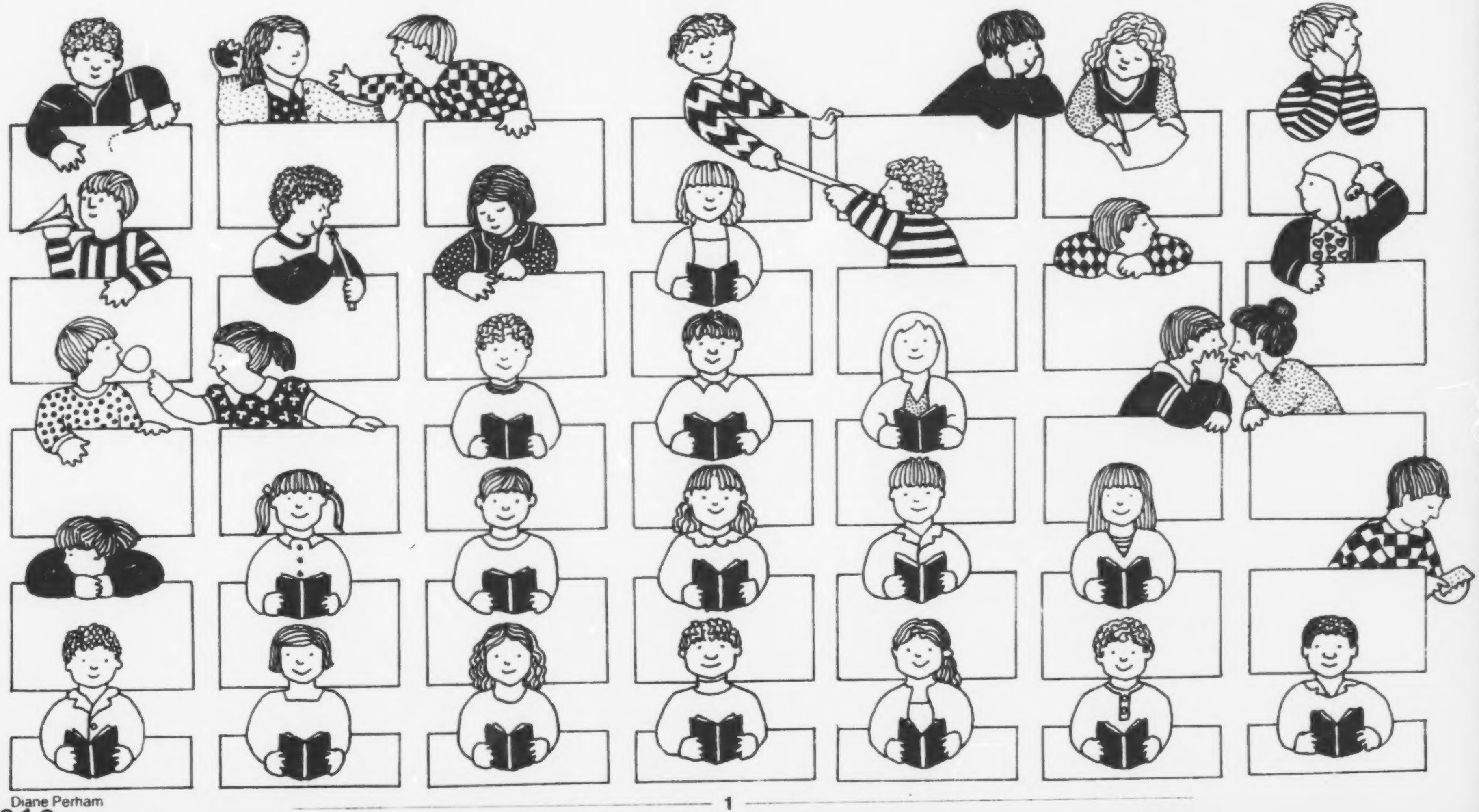
Three Dozen's a Crowd



Diane Perham

Three Dozen's a Crowd

By Jack Campbell and Margaret Robinson,
University of Queensland.

One of the most striking characteristics of classrooms since the Industrial Revolution to the present has been the large number of pupils within them. At no other stage in their lives will young people occupy such socially intimate settings for such extended periods of time. Buses, football pavilions, and cinemas may be more crowded than classrooms, but people rarely stay in them for long, and, perhaps more important, they do not have to meet the demands of individual and social learning within them.

Largely as a result of the studies by Glass and his associates, it is now fairly well accepted that large class size has a harmful effect upon the learning of school children, and it might be argued that the battle for smaller classes has been won. However, before this finding is translated into policies aimed at reducing class size, it is probably neccesary to identify the sequence of events which lies between the physical size of a school class and the achievement of pupils within it.

Speculative Explanations

Most of the speculative explanations relating to the effects of class size involve the teacher – for example, in a smaller class, the teacher is better able to: maintain close supervision over all of the pupils; provide individual instruction; avoid having lines of pupils waiting for attention or resources, and so on. These explanations invite the rejoinder that surely competent teachers should be able to develop strategies to maintain effective management, even though the class is large, and that incompetent ones would be ineffective whether they had four pupils or forty. Without buying into these arguments, it can be noted that large class size can generate a different sequence of events which remains throughout within the mental and emotional states of pupils, and is almost beyond the teacher's power to control. The sequence goes something like this: when the personal spaces which we establish around our physical selves are threatened or invaded, we are likely to become aggressive, or to withdraw; these responses will result in less energy being available to attend to what we planned to do; diminished attention, in its turn, will adversely affect achievement, especially when the task is a complex one. According to this line of reasoning, effects are likely to flow almost irrespective of teaching strategies.

The Study

During the last eighteen months we have been trying to test part of the 'crowding' hypothesis by monitoring the attending, withdrawn, and aggressive behaviour of primary-school pupils, first, when in a class of around 36, and, second, when in a class of around 26. A total of 14 classes have been involved – 10 which experienced a *reduction in size* of the kind just mentioned, 2 which had enrolments of 36 and were *not reduced* (these were used as 'controls'), and 2 which experienced an *increase* in size from 22 to 32 (these were used to check on the effects of change *per se*).

The Results

This study confirms the judgement of generations of teachers that large school classes lead to unproductive behaviour on the part of pupils:

1. When classes were reduced from 36 pupils to 26, the percentage of time spent on attending *increased* from 73.62 to 84.76 — during one school year of approximately 1,000 hours, this amounts to a difference of 111 hours, or 22 school days.
2. When classes were reduced from 36 pupils to 26, the percentage of time spent on withdrawn and aggressive behaviour *decreased* from 15.40 to 5.35 – i.e., approximately 100 hours or 20 school days in a school year.
3. Younger pupils were affected more by crowding than were older ones, but there were no sex-related differences.
4. 'Highly effective', 'moderately effective', and 'ineffective' teachers were all able to secure an improvement in the attending of their pupils when their classes were reduced in size.

Discussion

During the last six months we have had the opportunity to discuss the study and its findings with teachers and school administrators throughout Australia, and we thought that readers might find it interesting to listen in, as it were, to the reactions of perceptive critics, and to our responses.

1. Q. *How do you know that the effects which you claim to have identified are associated with class size?*

A. We were engaged not in a simple survey, but in a naturally-occurring *experiment*, and this is accepted as a reputable design. The variations in class size were part of the on-going life of schools and were not contrived by us; we acted out a non-interfering role, merely recording the continuous stream of classroom behaviour of the pupils by means of unobtrusive, but sophisticated, event recorders and a microprocessor; there was a substantial measure of control over the two sets of observations (pre- and post-change) in as far as the children were compared with themselves and were being taught the same kind of lesson (usually language-arts or arithmetic), by the same teacher, in the same room, and at the same time of day. In addition, pupils in classes which did not experience a reduction in size revealed no changes in behaviour, and those in classes which went from small to large revealed a *decrease* in attending behaviour and a corresponding *increase* in withdrawn and aggressive behaviour. These experimental data look convincing to us, and certainly they are very stable – the same results emerged in class after class.

Finally, the findings are consistent with theory, and, perhaps more important, with the intuitive knowledge of almost all classroom teachers. Teachers process a lot of information in the course of their careers, and we feel reassured when our research findings are in line with their judgements.

2. Q. *You seem to have a hang-up associated with attending behaviour on the part of pupils.*

A. Attending, or 'on-task' behaviour arises as part of the theoretical argument concerned with the effects of crowding, and this is the reason why it features prominently. In addition, however, – and this is a bonus – several recent studies show that, if a person is compared with himself or herself, the attention which is given to mastering a task is the best single index of how much will be learnt. Thus, if we spend six hours per week trying to master the piano, and only one hour trying to master some other equally difficult task, it could be expected that we would master the piano before the other task. Attending behaviour *is* a very significant variable in learning.

3. Q. *But by focusing on attending behaviour you project a notion of school learning which is very narrow and academic; what about personal and social development?*

A. It is true that *attending* behaviour has an academic, if not industrial, ring about it, but the theory also features other behaviours which are at the very heart of personal and social adjustment – *withdrawal* and *aggression*. The effects of class size include affective as well as cognitive outcomes, and it is very likely that the former are the more responsive to crowding; certainly, as the theory proclaims, they have priority.

4. Q. *O.K., but what is the optimum time for a pupil to spend attending a learning task?*

A. We have no satisfactory answer to this, and other research literature doesn't help, either. We accept the implication that the optimum is unlikely to be 100 per cent – there is a need for some tuning out. We could be wrong, but it is our judgement that 85 per cent of time spent attending to the learning task is better than 74 per cent, especially when the difference is spent on withdrawn and aggressive behaviour. Unless a pupil is actually attending to the task set by the teacher, the classroom is not a very stimulating place; in this respect, it differs from the play ground, museum, and the city streets, where children might go 'off task' and still learn a lot.

5. Q. *If your findings are sound, why not simply increase the size of classrooms – say from 6m x 7m to 7m x 8m and so avoid overcrowding?*

A. This sounds plausible – and cheaper! One of our two classes which increased in size from 22 to 32 was able to maintain the space per pupil by moving back flexible walls, whereas the other one wasn't able to do this, and so we had an opportunity to untangle the two confounding variables – number of pupils, and space. The findings suggest that increasing the size of classrooms helps to overcome the crowding a little, but it is clear that sheer numbers, almost irrespective of space, can generate a sense of crowding. In addition, especially when the pupils are young, the number can be too large for one teacher to manage effectively – too much time will be spent waiting for attention, for resources, for others to finish and so on. There is some, but not much, mileage in making classrooms larger.

6. Q. *What is the optimum size of a school class?*

A. Our study doesn't provide the answer to this; we have undertaken research within the special circumstance of classes being reduced by about 10 pupils when their enrolments approximate 37, and we have no evidence beyond this circumstance. The issue is one of what is a comfortable personal space for learning. Our data suggest that when 36 pupils are in a area of 42m^2 they are too close for comfort, and that 26 pupils in the same area are more comfortable, but we would not want to argue that 1 pupil, or even 5 pupils, would feel optimally comfortable in those 42m^2. Just as they feel threatened when their personal spaces are invaded, so many young people seek the proximity of others and would become anxious if there was too great a separation. It would not surprise us if the optimum size of a class within an area of 42m^2 was between 15 and 20 pupils, but this is little more than speculation.

7. Q. *Your study has involved only traditionally-designed, one teacher classrooms; what about multiple-area classrooms, team-teaching situations, composite classes and the like?*

A. A good question! In this pioneer study, we have taken the simplest set of conditions, and we make no arrogant claim that there are no more worlds to conquer.

8. Q. *Your conceptualization of the sequence of events is highly pupil-centred; as you say, it stays within the psychology of the pupil, and the teacher and her control mechanisms are blotted out.*

A. This is true, and, as behaviour-setting theorists, we take the implied criticism to heart. The conceptualization presented in the study seems to be strongly supported by the data, but, as in most research investigations, there remains the possiblity that other conceptual frameworks would be equally, or even more effective. We have extensive data on teaching strategies employed by the teachers under the two class-size conditions, and we plan to syncronize these with the behavioural data from the pupils to test the efficiency of alternative viewpoints. The Gordian knot is real and can be unravelled only a few threads at a time. At the risk of mixing metaphors, and with apologies to Lewis Carroll: the further off from England, the nearer is to France – then turn not pale upon the trail, but come and join the dance!

NOTE

The study referred to is presented in detail in a report to the Education Research and Development Committee, Canberra, 1982, under the title 'A Social-Density Explanation of Class-Size Effects'.

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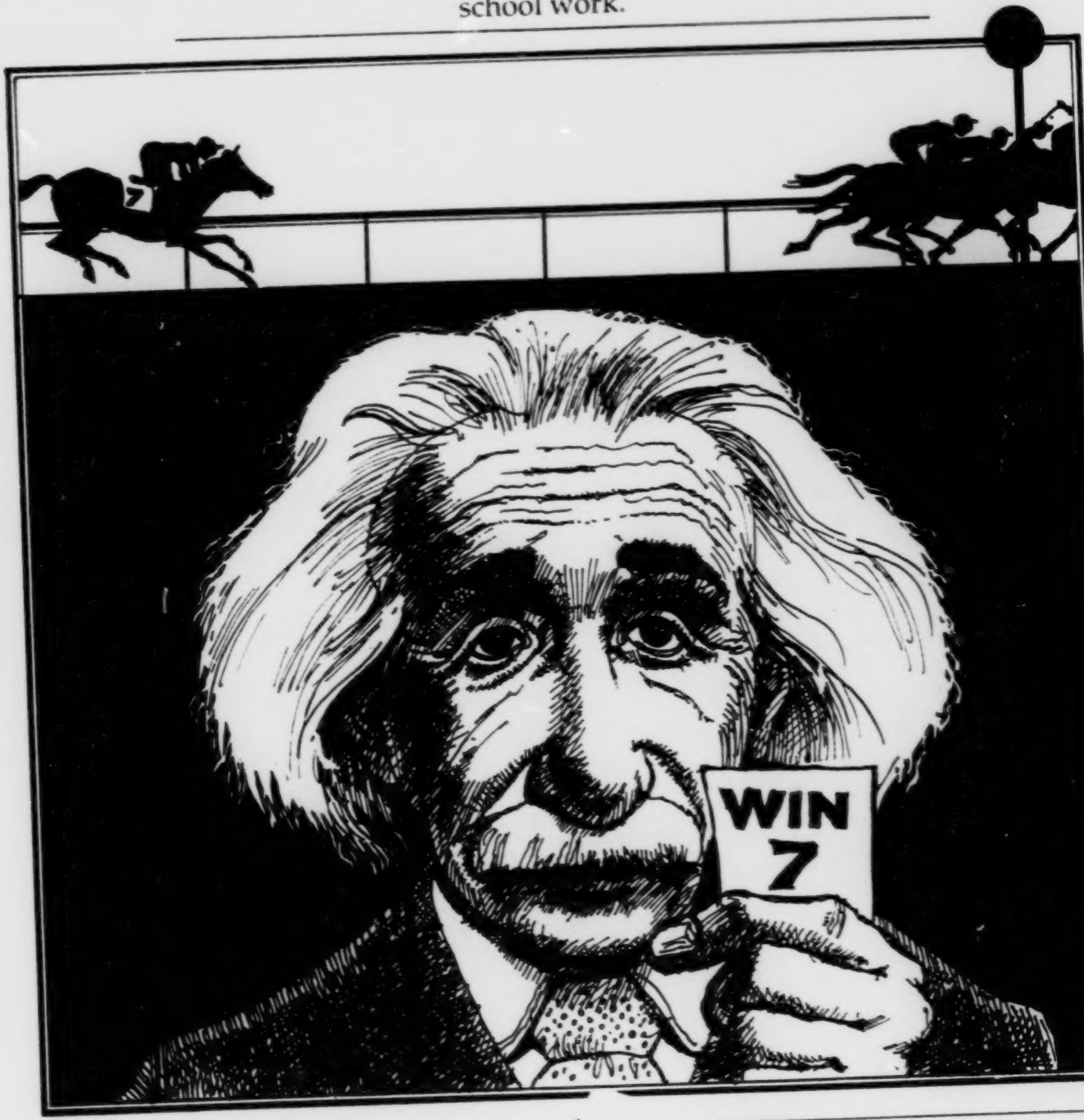
set
number one 1994

A Day at the Races:

IQ, EXPERTISE, AND COGNITIVE COMPLEXITY

Stephen Ceci and Jeffrey Liker

WE NEED A REMINDER, from time to time, not to pick a horse by its colour, nor a human being by his or her school work.



THE RELATION between IQ and 'intelligence' has aroused considerable debate. Many researchers say that intelligence tests measure general intelligence (sometimes called Spearman's 'g') and the idea that your IQ tells you how intelligent you are has become so widespread that it is common to read about the estimated IQ required to accomplish certain feats, occupy certain jobs, and succeed at certain ventures. In a 1982 court case in England, a 32-year-old man, called 'X', who was accused of financial fraud, was tested at the time of his arrest and found to have a second-grade reading competence, and an IQ of 80. Eysenck and colleagues, giving expert testimony, argued 'It would seem to have been impossible for a person of X's level of intelligence and literacy... to have played a significant part in planning or carrying out the financial transactions which were the subject of the trial.' Note the word *impossible*.

Heim provided expert testimony for the prosecution and suggested that the defendant's poor reading performance and low IQ were both due to dyslexia. As evidence that his 'true' IQ (intelligence) could not possibly be as low as 80, she pointed out that X regularly had won large sums of money in London clubs playing a cognitively complex card game known as Kalooki, spoke four languages, and had amassed considerable savings. 'If [the court] can produce a few borderline defectives who speak four languages, for instance, I am sure that I am not the only psychologist who would be interested to meet them.'

Apparently Heim too believed that a 'true' IQ of 80 (i.e., one not depressed by dyslexia) was incompatible with such accomplishments as speaking multiple languages and winning at Kalooki.

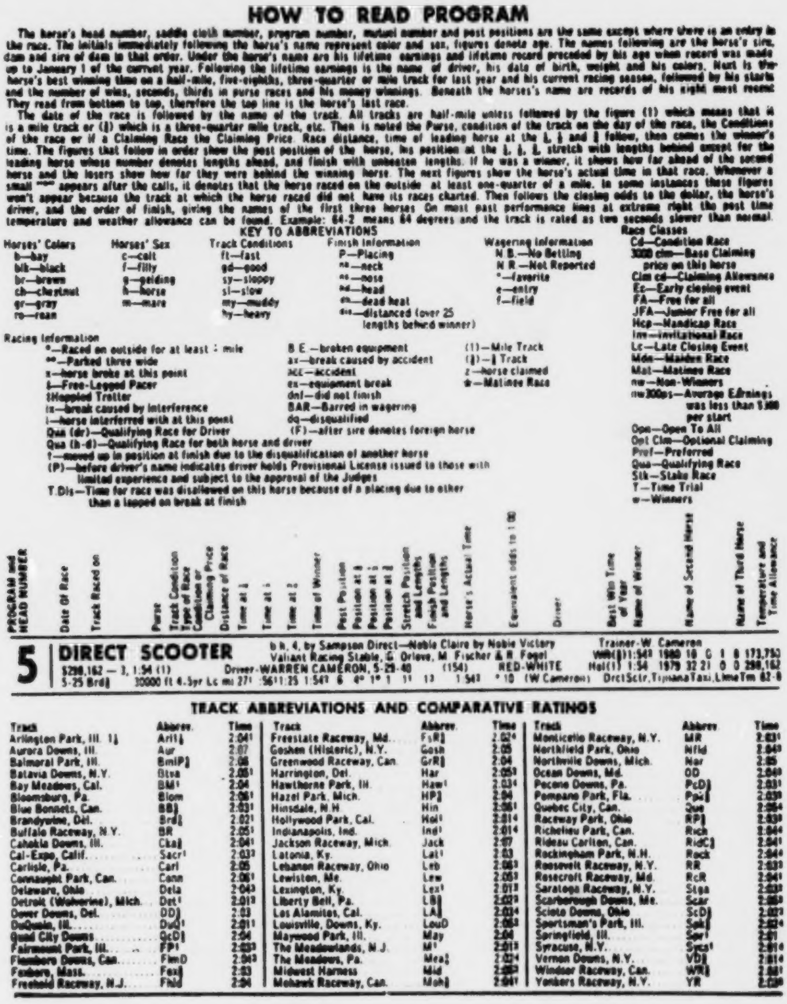
...It is common to read about the estimated IQ required to accomplish certain feats.

However, there is evidence that IQ and 'intelligence' are not at all the same: anthropologists have described in many case studies how both non-literate and semi-literate peoples engage in highly complex forms of everyday (that is, non-academic) reasoning, yet do quite poorly on Western measures of intelligence, even when these tasks have been adapted to the local culture.

Our study follows this trail along in 'civilised' western society, and looks at cognitive complexity of a real-world task, racetrack handicapping, and examines the relation between the sophistication of this reasoning process and IQ.

Chart 1

The instruction page from the Official Form Program, *Brandywine Racetrack*



HOW TO READ PROGRAM

The horse's head number, saddle cloth number, program number, mutuel number and post positions are the same except where there is an entry in the race. The initials immediately following the horse's name represent color and sex, figures denote age. The names following are the horse's sire, dam and sire of dam in that order. Under the horse's name are his lifetime earnings and lifetime record preceded by his age when record was made up to January 1 of the current year. Following the lifetime earnings is the name of driver, his date of birth, weight and his colors. Next is the horse's best winning time on a half-mile, five-eighths, three-quarter or mile track for last year and his current racing season, followed by his starts and the number of wins, seconds, thirds in purse races and his money winnings. Beneath the horses's name are records of his eight most recent. They read from bottom to top, therefore the top line is the horse's last race.

The date of the race is followed by the name of the track. All tracks are half-mile unless followed by the figure (1) which means that it is a mile track or (¾) which is a three-quarter mile track, etc. Then is noted the Purse, condition of the track on the day of the race, the Conditions of the race or if a Claiming Race the Claiming Price. Race distance, time of leading horse at the ¼, ½ and ¾ follow, then comes the winner's time. The figures that follow in order show the post position of the horse, his position at the ¼, ½, ¾, stretch with lengths behind except for the leading horse whose number denotes lengths ahead, and finish with unbeaten lengths. If he was a winner, it shows how far ahead of the second horse and the losers show how far they were behind the winning horse. The next figures show the horse's actual time in that race. Whenever a small "°" appears after the calls, it denotes that the horse raced on the outside at least one-quarter of a mile. In some instances these figures won't appear because the track at which the horse raced did not have its races charted. Then follows the closing odds to the dollar, the horse's driver, and the order of finish, giving the names of the first three horses. On most past performance lines at extreme right the post time temperature and weather allowance can be found. Example: 64-2 means 64 degrees and the track is rated as two seconds slower than normal.

KEY TO ABBREVIATIONS

Horses' Colors
b—bay
blk—black
br—brown
ch—chestnut
gr—gray
ro—roan

Horses' Sex
c—colt
f—filly
g—gelding
h—horse
m—mare

Track Conditions
ft—fast
gd—good
sy—sloppy
sl—slow
my—muddy
hy—heavy

Finish Information
P—Placing
nk—neck
ns—nose
hd—head
dh—dead heat
dis—distanced (over 25 lengths behind winner)

Wagering Information
N.B.—No Betting
N.R.—Not Reported
*—favorite
e—entry
f—field

Race Classes
Cd—Condition Race
3000 clm—Base Claiming price on this horse
Clm cd—Claiming Allowance
Ec—Early closing event
FA—Free for all
JFA—Junior Free for all
Hcp—Handicap Race
Inv—Invitational Race
Lc—Late Closing Event
Mdn—Maiden Race
Mat—Matinee Race
nw—Non-Winners
nw300ps—Average Earnings was less than $300 per start
Opn—Open To All
Opt Clm—Optional Claiming
Pref—Preferred
Qua—Qualifying Race
Stk—Stake Race
T—Time Trial
w—Winners

Racing Information
°—Raced on outside for at least ¼ mile
°°—Parked three wide
x—horse broke at this point
‡—Free-Legged Pacer
†Hoppled Trotter
ix—break caused by interference
i—horse interferred with at this point
Qua (dr)—Qualifying Race for Driver
Qua (h-d)—Qualifying Race for both horse and driver
†—moved up in position at finish due to the disqualification of another horse
(P)—before driver's name indicates driver holds Provisional License issued to those with limited experience and subject to the approval of the Judges
T.Dis—Time for race was disallowed on this horse because of a placing due to other than a lapped on break at finish

B.E.—broken equipment
ax—break caused by accident
acc—accident
ex—equipment break
dnf—did not finish
BAR—Barred in wagering
dq—disqualified
(F)—after sire denotes foreign horse

(1)—Mile Track
(⅝)—⅝ Track
z—horse claimed
★—Matinee Race

PROGRAM and HEAD NUMBER
Date Of Race
Track Raced on
Purse
Track Condition
Type of Race
Condition or Claiming Price
Distance of Race
Time at ¼
Time at ½
Time at ¾
Time of Winner
Post Position
Position at ¼
Position at ½
Position at ¾
Stretch Position and Lengths
Finish Position and Lengths
Horse's Actual Time
Equivalent odds to 1.00
Driver
Best Win Time of Year
Name of Winner
Name of Second Horse
Name of Third Horse
Temperature and Time Allowance

5 **DIRECT SCOOTER** b h, 4, by Sampson Direct—Noble Claire by Noble Victory Trainer-W. Cameron
Valiant Racing Stable, G. Orlove, M. Fischer & R. Fogel WR(⅝)1:54^{3} 1980 18 6 1 0 173,753
$298,162 — 3, 1:54 (1) Driver-WARREN CAMERON, 5-25-40 (154) RED-WHITE Hol(1) 1:54 1979 32 21 0 0 298,162
5-25 Brd⅝ 30000 ft 4-5yr Lc mi 27^{1} :56^{1}1:25 1:54^{3} 6 4° 1° 1 1^{1} 1^{3} 1:54^{3} *.10 (W Cameron) DrctSctr,TijuanaTaxi,LimeTm 82-0

TRACK ABBREVIATIONS AND COMPARATIVE RATINGS

Track	Abbrev.	Time	Track	Abbrev.	Time	Track	Abbrev.	Time
Arlington Park, Ill. 1⅛	Arl⅛	2:04^{1}	Freestate Raceway, Md.	FsR⅝	2:02^{4}	Monticello Raceway, N.Y.	MR	2:03^{1}
Aurora Downs, Ill.	Aur	2:07	Goshen (Historic), N.Y.	Gosh	2:05	Northfield Park, Ohio	Nfld	2:04^{3}
Balmoral Park, Ill.	BmlP⅝	2:06	Greenwood Raceway, Can.	GrR⅝	2:04	Northville Downs, Mich.	Nor	2:05
Batavia Downs, N.Y.	Btva	2:05^{1}	Harrington, Del.	Har	2:05^{3}	Ocean Downs, Md.	OD	2:04^{3}
Bay Meadows, Cal.	BM^{1}	2:04	Hawthorne Park, Ill.	Haw^{1}	2:03^{4}	Pocono Downs, Pa.	PcD⅝	2:03^{1}
Bloomsburg, Pa.	Blom	2:06^{1}	Hazel Park, Mich.	HP⅝	2:04	Pompano Park, Fla.	Ppk⅝	2:03^{3}
Blue Bonnets, Can.	BB⅝	2:03^{1}	Hinsdale, N.H.	Hin	2:06^{1}	Quebec City, Can.	Que	2:06^{4}
Brandywine, Del.	Brd⅝	2:02^{1}	Hollywood Park, Cal.	Hol^{1}	2:01^{4}	Raceway Park, Ohio	RP⅝	2:03^{3}
Buffalo Raceway, N.Y.	BR	2:05^{1}	Indianapolis, Ind.	Ind^{1}	2:01^{4}	Richelieu Park, Can.	Rich	2:04^{4}
Cahokia Downs, Ill.	Cka⅝	2:04^{1}	Jackson Raceway, Mich.	Jack	2:07	Rideau Carleton, Can.	RidC⅝	2:04^{1}
Cal-Expo, Calif.	Sacr^{1}	2:03^{3}	Latonia, Ky.	Lat^{1}	2:03	Rockingham Park, N.H.	Rock	2:04^{4}
Carlisle, Pa.	Carl	2:05	Lebanon Raceway, Ohio	Leb	2:06^{3}	Roosevelt Raceway, N.Y.	RR	2:03^{3}
Connaught Park, Can.	Conn	2:06^{1}	Lewiston, Me.	Lew	2:05^{3}	Rosecroft Raceway, Md.	RcR	2:04^{1}
Delaware, Ohio	Dela	2:04^{3}	Lexington, Ky.	Lex^{1}	2:01^{3}	Saratoga Raceway, N.Y.	Stga	2:03^{3}
Detroit (Wolverine), Mich.	Det^{1}	2:01^{3}	Liberty Bell, Pa.	LB⅝	2:02^{3}	Scarborough Downs, Me.	Scar	2:05^{3}
Dover Downs, Del.	DD⅝	2:03	Los Alamitos, Cal.	LA⅝	2:03^{4}	Scioto Downs, Ohio	ScD⅝	2:02^{3}
DuQuoin, Ill.	DuQ^{1}	2:01^{1}	Louisville, Downs, Ky.	LouD	2:06^{3}	Sportsman's Park, Ill.	Spk⅝	2:02^{4}
Quad City Downs	QcD⅝	2:04	Maywood Park, Ill.	May	2:04	Springfield, Ill.	Spr^{1}	2:01
Fairmount Park, Ill.	FP^{1}	2:03^{3}	The Meadowlands, N.J.	M^{1}	2:01^{3}	Syracuse, N.Y.	Syra^{1}	2:01^{4}
Flamboro Downs, Can.	FlmD	2:04^{3}	The Meadows, Pa.	Mea⅝	2:02^{4}	Vernon Downs, N.Y.	VD⅝	2:01^{4}
Foxboro, Mass.	Fox⅝	2:03	Midwest Harness	Mid	2:06^{3}	Windsor Raceway, Can.	WR⅝	2:03^{1}
Freehold Raceway, N.J.	Fhld	2:04	Mohawk Raceway, Can.	Moh⅝	2:04^{1}	Yonkers Raceway, N.Y.	YR	2:03^{3}

Method

In the Spring of 1982, Brandywine Raceway, Incorporated, a harness racetrack in North Wilmington, Delaware, gave us permission to begin a 3-year study by interviewing long-time patrons. With the assistance of raceway staff, 110 racegoers were approached as they were buying an Early Form on the day prior to post time. Thirty men were selected. They agreed to devote 10 hours to the study, be interviewed, take the Wechsler Adult Intelligence Scale test (WAIS), handicap 10 regular races, and handicap an additional 50 imaginary races contrived by us.

Procedure

Distinguishing experts from nonexperts. We checked how well they handicapped 10 regular races described in the Early Form. The Early Form is available the day prior to the race, and contains a full array of statistics on the horses, jockeys, and physical track, without any sports columnists' or professional track experts' evaluations. Only serious racegoers purchase the Early Form, which gives them an additional 8 hours to analyse race statistics. Two tasks were used: (1) to pick the horse that was most likely to be named the 'top horse' at race time by the betting public, and, (2) to pick the 'top three horses' in their exact order of odds at race time. We used prediction-of-odds, rather than the actual race, because harness racing is affected by many events, such as broken equipment and collisions, that cannot be anticipated.

Two clusters of handicappers were apparent. A group of 14 were far superior to the remaining 16 on both tasks (see Table 1). The 14 we called *experts* and the others the *nonexperts*. Nonetheless, the nonexperts were by no means novices – their performance was still far in excess of chance.

Characteristics of experts and nonexperts. We gave them all the short version of the Wechsler Adult Intelligence Scale, an IQ test, and checked other particulars such as their age, jobs, earnings. Experts and nonexperts were very similar in years of formal education, occupation, and years of track experience. That experts and nonexperts had comparable experience at the track suggests that expertise arises from more than sheer practice. However, IQs and success in judging odds did not match – there was a substantial range of IQs for experts (from 81 to 128) and nonexperts (80 to 130).

The handicapping task. All our racegoers were asked to handicap 50 unnamed horses (described by extensive statistics on past performance and current race characteristics) against an unnamed standard horse, and to assign the probable odds for each comparison.

The standard horse was depicted as an average calibre horse with various past performance statistics (e.g., speed, life-time earnings, driver, etc.) and current race characteristics (e.g., race driver's ability, track size, etc.). The past performance and current race data for the 50 horses were selected from actual racing programmes. There are between 20 and 30 variables contained in a racing programme, depending on how one does the coding. We kept several variables constant across horses and races (breeding was one) because of the difficulty otherwise. For example, some sires and dams are *trot-bred* and others are *pacer-bred*; some horses have reputed prowess running on muddy surfaces, others from behind the pack.

Chart 1 shows an actual instruction page of the Brandywine *Official Form Program*. Programmes for the 50 test horses were prepared using a format similar to the Brandywine form.

Modelling the handicapping process. This was a highly statistical exercise and involved a few rather unlikely combinations, such as the standard horse – worth only an average amount – running against very high and very low priced challengers. (The details can be found in the original paper.) However, we generally gave our experts and nonexperts tasks less complex than they would normally come across.

> ...The expert understands that individual factors must be considered in context.

Interactive model variable (IMV). A complete novice considers each statistic independently. Which horse has the fastest lifetime speed? Which had the best position of finish in their most recent race? Which has earned the highest purses? and so forth. The expert, however, understands that these individual factors must be considered in context. For example, coming in third in one race may be more impressive than coming in first in another race. After interviews with professional handicappers, employed by the racetrack, we realised that we needed a statistical model that did more than add factors together. It involved some simple additive effects, as well as complex interaction effects among as many as seven variables describing the horse's prior race (i.e., last race speed, closing speed, driver quality, purse size, track size, track conditions, number of moves). To verify our reasoning process, a professional handicapper, who hosted a nightly racing show on television, went through the races and provided extensive commentary about each race, including his judgment as to which horse would win. His reasoning process matched quite well the process we had gone through to generate the IMV.

In order to capture the professional handicapper's reasoning, we present in Chart 2 a comparison between two horses, No.23 and No.24.

Chart 2

Comparative Past Performance Statistics for Two Horses, No. 23 and No. 24

Statistic	No. 23	No. 24
Date	9-22	9-21
Name of track	VD	Brd
Track size	3/4	5/8
Purse size	$2,800	$2,800
Track condition	ft	gd
Claiming price	$8,000	$8,000
Leader's quarter-mile time	29^3	32
Leader's half-mile time	59^4	$1{:}04^1$
Leader's three-quarter mile time	$1{:}30^3$	$1{:}33^4$
Leader's final time	$2{:}00^3$	$2{:}04^2$
Horse's post position	7	7
Horse's quarter-mile position	5	7
Horse's half-mile position	3^{oo}	2^{oo}
Horse's three-quarter mile position	2^3	2^4
Horse's final position	2^5	3^1
Horse's final time	$2{:}01^3$	$2{:}04^3$
Horse's post-time odds	4.10	3.20
Horse's driver	D.Dancer	D.Dancer
Lifetime earnings	$31,299	$43,192
Lifetime speed	$1{:}59^4$	2:03

Note: Superscripts refer to fifths of a second in times and to lengths in positions. "oo" = two sulky-widths away from the rail at point in question.

The professional handicapper felt that No.24 would easily beat No.23. Here is a (shortened) explanation of his reasoning, which our IMV model reflected.

Lifetime speed. This gives No.23 the edge. No.23 had a best winning speed of 1 minute 59 seconds. No.24's best was 2:03. This was even after taking a couple of seconds off No.24 because it was clocked on a smaller track with more curvature, resulting in more 'off-the-rail' time on turns and consequently slower times.

Last race speed. The edge here goes to No.24 even though he was 3 seconds slower. This variable can only be interpreted in the context of the three variables that follow.

...**E**xpert handicapping is a cognitively complex process that is unrelated to IQ.

Moves and track conditions. *Moves* refers to the number of energy-depleting manoeuvres a horse displayed during a race and, in combination with *track conditions*, helps the expert interpret the horse's performance in the last quarter mile. For example, No.23 and No.24 both were 'parked out' between the second and third quarter mile of the race. This means that they were both two sulky widths away from the rail at that time, presumably attempting to pass the horse in front of them. This would be an energy-depleting move because each time a horse leaves the rail to pass a front runner, he must both run extra distance and increase his speed for a short period to overtake. However, both horses' moves were not equally difficult: No.24's move occurred during a fast paced part of the race whereas No.23's move occurred during a more relaxed pace. Furthermore, No.23 was on a 'fast' track whereas No.24's were on a 'good' track surface when extra soil moisture would require even more effort. Taken together No.24's move was considerably more difficult than No.23's.

Closing speed. Given that both horses made energy-depleting moves during the third quarter of the race (No.24 more so than No.23), one can ask about the likely energy each horse could muster to run the final quarter mile of the race. At the start of the fourth quarter both horses were placed second in their respective races. As they entered the stretch (the last eighth mile), they still were in second place. No.23 was three lengths behind the leader of his race and No.24 was four lengths behind the leader of his race. No.23 finished in second place, 5 lengths behind the winner, while No.24 finished third, but only 1 length behind the winner of his race. The handicapper assessed the strength of each horse's closing speed. Therefore, he concluded that No.24, despite his slower time had a more difficult 'trip' and still had the energy to finish stronger.

...**E***xperts* with low IQs always used **more** complex reasoning.

Validation of the IMV. To establish the cognitive complexity of harness handicapping, several related analyses were undertaken. They supported our notion that complex, higher-order judgment is at work.

Results

IQ and Expertise

Is there a relation between expertise at handicapping and IQ? The correlations presented in Chart 3. They show that IQ is not correlated with any of the measures of expertise.

Chart 3

Correlations Between IQ and Expertise of Raters (N = 30)

Characteristics	1	2	3	4	M	SD
1. IQ test score*	1.0				99.9	15.1
2. Correct top horse (%)	.07	1.0			61%	32%
3. Correct top three horses (%)	.04	.93	1.0		33%	30%
4. Expertise**	.06	.97	.95	1.0	1.5	0.5
5. Years of track experience	-.42	-.30	-.17	-.18	16.0	3.9

* Measured by the Wechsler Adult Intelligence Scale (WAIS) for 26 of the 30 subjects.

** 1 = nonexpert, 2 = expert. Success in picking horses with the highest post-time odds on the basis of the morning race form. Top three horses must be in their correct order of placement on post-time odds. To qualify as experts, subject must pick top horse 90% of the time and top three horses 50% of the time.

Experience and Expertise

Is there a relation between experience and expertise? The number of years of experience at the track ranged from 8 years to 26 years. Those with relatively low IQs have more experience at the track, on average, than do those with higher IQs. This might lead one to suspect that the added experience gives people with low IQs an advantage, which compensates for a disadvantage in their cognitive processing ability. However, this explanation is implausible: the experts, on the whole were not those with the longer experience. A further statistical check was made by controlling for years of experience and then looking for relations. There was still no significant link.

IQ is not related to handicapping expertise. This we can say with some confidence. Consider the range of IQs in the sample: 4 of the experts had IQs in the low to mid 80s. One, a construction worker with an IQ of 85 who had been a regular at the track for 16 years, picked the top horse in 10 out of 10 races and picked the top three horses in correct order 5 out of 10 races. In contrast, one nonexpert, a lawyer with an IQ of 118 who had been going to the track regularly for 15 years, correctly picked the top horse in only 3 out of 10 races and the top three horses in only 1 out of 10 races.

That subjects with relatively low IQs could almost perfectly match the professionals in handicapping races suggested to us that there must be a systematic process for setting odds that can be learned by anyone. However, the process of expert handicapping seems to be far more complex than this, as illustrated by the professional handicapper's example above. From interviews, we learnt that relatively complex algorithms were used to consider combinations of variables.

Handicapping Complexity

We next considered how our experts/nonexperts assessed the odds for the 50 challengers to the standard racehorse.

There are many technical issues which warrant discussion and these can be found in other articles, but it is sufficient to remind ourselves here that 30 subjects and 50 distinct comparisons yield 1500 cases. These 1500 cases are not statistically independent and therefore, a sample size of

1500 **overstates** the true degree of freedom to choose which the racegoers had. On the other hand, estimating separate equations for each subject and computing statistical tests on the basis of 30 cases per regression clearly **understates** the degrees of freedom.

IQ and Model Complexity

One might ask whether men with relatively low IQs are as likely as those with higher IQs to use the way of arriving at their conclusions which we used. They are. The only exception was Subject 17, it is not clear why, but we suspect this gentleman did not take the rating task seriously! There was a further finding, that experts with low IQs always used **more** complex thinking than the non-experts with high IQs, even though both had similar amounts of experience attending races.

Discussion

The results of the various analyses, taken together, suggest that expert handicapping is a cognitively complex process that is unrelated to IQ. Almost all of the experts used a decision process similar to the statistical model (called IMV) which we constructed to reflect what professional racecourse handicappers do. The use of the IMV is a statistical programme analogous to the form of multivariate reasoning in multiple regression with multiple interaction terms. Added support to our conclusion comes directly from responses to interview questions, tape recorded during the handicapping exercise. Almost all of the experts (12 out of 14), and 5 of the nonexperts, showed that they were using this complex reasoning process.

It is clear that the IMV, though able to account for a substantial portion of the variance in our experts' choices, is far less than the complete story as far as handicapping is concerned. Bear in mind that the IMV accounted for variation in 2-horse comparisons, not the regular 8- to 10-horse fields that handicappers encounter. Had the experts been asked to handicap the typical 8-horse field, many additional variables would have been required. Some of these variables are difficult to quantify and nearly impossible to manipulate experimentally, for example, a horse's 'personality' when running from a come-from-behind position, or 'schemas' that cast a group of horses into a probabilistic construction of how the race will develop. Anyone who has ever spent time around expert handicappers will appreciate the importance of this schema variable. Depending on the 8 horses entered in a race, strategies and second guessing abound. (For example, experts argue adamantly about the need for horse A to avoid challenging horse B at the first quarter-mile mark, if horse C is to have any chance of beating horse D!) Each race has a scheme that, if not in practice, at least in principle, can be forecast by expert handicappers.

IQ, Expertise, and Cognitive Complexity

So we must come to the conclusion that, whatever it is that an IQ test measures, it is not the ability to engage in cognitively complex forms of multivariate reasoning. The limited range of abilities and contexts involved in standardised tests suggest (inaccurately) an equally limited range of practical intelligence for us to use in our everyday coping with challenges. We are all smarter than that.

IQ and School

What then can we say about IQ, intelligence and schooling? IQ may not be highly correlated with reasoning at the races but it is highly correlated with years of school attendance. This is probably because IQ tests reflect cultural knowledge that is either (1) directly taught in school, for example: Who wrote Hamlet? Where are the pyramids? What are marsupials? What is the boiling point of water? or (2) indirectly inculcated via classroom exercises, for example: types of sorting that depend on taxonomic similarities such as 'This is erosion by wind; this is erosion by running water; this is erosion by the sea...' It is known that ease with taxonomic sorting increases with school attendance.

IQ and Life

If IQ does not predict complex reasoning ability what does it predict? Academic performance? Yes. Lifetime earnings? In a sort of a way. Satisfaction with life? No.

To disentangle the basis for these predictions we, and other colleagues, have conducted analyses on longitudinal data sets for many years. In one study published in 1992 we showed that IQ was not what mattered in predicting what people earned in their lives. We examined data collected on half a million Americans between 1960 and 1964 when they were at high school, aged 14 to 18. These data included many cognitive variables such as their reading comprehension, maths, analogies, vocabulary scores, and so on. By the method of 'principal components' we were able to reduce these to a single score which reflects the maximum linear variance shared by all scores, a so-called 'general intelligence'. This score is highly related to IQ.

We asked ourselves whether IQ would predict earnings 15 years after high school, once we had taken into consideration other things we knew about these individuals, such as their parents' educational level, their family wealth, the type of neighbourhoods they came from, etc. (All this information was available from the data set.) We tested this prediction using a sub-sample of the data, approximately 50,000 individuals.

It turns out that your IQ does not predict how much money you will be earning 15 years after high school (once family origins are taken into account) nor how satisfied with your life you will be. Low IQ children of wealthy families were earning far more than high IQ children from poor families. Within families there was no consistent relationship between IQ and later earnings. In many families the highest IQ children went on to become teachers, social workers, librarians, clergy, etc., whilst the low IQ children inherited the family dry-cleaning business or daddy's bank. One could almost say that if your fairy godmother gives you the choice of being born smart or born rich, opt for the latter.

Notes

DR STEPHEN J. CECI is Distinguished SUNY Exchange Professor at Cornell University, USA.

DR JEFFREY K. LIKER is at the University of Michigan.

This set item is a summary of the findings first published in
Ceci, S.J. and Liker, J.K. (1986). A day at the races: A study of IQ, expertise and cognitive complexity. **Journal of Experimental Psychology,** Vol. 115, No. 3, pp. 255-266.

Spearman's concept of general intelligence (g) can be found, first, in
Spearman, C.B. (1904) General intelligence objectively determined and measured. *American Journal of Psychology* Vol. 15, pp. 201-293

and is assumed, for example, in
Eysenck, H. (1971) *The IQ argument: Race, intelligence, and education.* New York: Library Press

and
Wechsler, D. (1958) *The measurement and appraisal of adult intelligence* (4th ed.), Baltimore, MD: Williams and Wilkins.

However, it is challenged by many, for example, in
Baron, J. (1985) *Rationality and intelligence.* New York: Cambridge University Press

A theory of multiple intelligences, close to that in our conclusion, can be found in

Gardner, H. (1983) *Frames of Mind: The theory of multiple intelligences*. New York: Basic Books.

The English court case is discussed in detail in

Tunstall, O., Gudjonsson, G., Eysenck, H. and Haward, L. (1982) Professional issues arising from psychological evidence presented in court. *Bulletin of the British Psychological Society*, Vol. 35, pp. 329-331.

and

Heim, A. (1982) Professional issues arising from psychological evidence presented in court: A reply. *Bulletin of the British Psychological Society*, Vol. 35, pp. 332-333.

Cognitive anthropology is an interesting study. The adaptation of Western results to local cultures is described in

Cole, M., Gay, J., Glick J.A. and Sharp, D.W. (1971) *The cultural context of learning and thinking*. New York: Basic Books.

The reasoning of the 'Kung San adult men of the Kalahari desert is vividly described in

Super, C.M. (1980) Cognitive development: Looking across at growing up. In C.M. Super and S. Harkness (Eds.) *New directions for child development: Anthropological perspectives on child development*. Vol. 8, pp. 59-69.

Reference to school attendance, literacy and intelligence is made in

McDonald, G. (1993) Learning to be intelligent. *set* No.2, 1993, item 2.

Also, mentioned in that item, is the work of Scribner and Coles

Scribner, S. and Cole, M. (1981) *The Psychology of Literacy*. Cambridge, MS: Harvard University Press.

Though extremely interesting, these anthropological case studies are unsatisfactory in their analyses of the cognitive processes involved in real-world endeavours. It is unclear, for example, whether processes underlying skilled behaviour are complex forms of information processing or rote, overlearned procedures. A more direct assessment of the relation between cognitive complexity and traditional measures of intelligence has been undertaken recently to determine a hierarchy of cognitive strategies, from random, trial-and-error approaches to sophisticated hypotheses-checking strategies, that can be applied to a real-world problem such as city management. In these problem-solving tasks, Dorner and his colleagues have consistently reported a lack of correspondence between their subjects' IQ and the cognitive sophistication of their solutions.

Dorner, D. and Kreuzig, H. (1983) Problemlosefahigkeit und intelligenz [Problem-solving ability and intelligence]. *Psychologische Rundhaus*. Vol. 34, pp. 185-192.

That taxonomic sorting ability increases with school attendance is detailed in

Ceci, S.J. (1991) How much does schooling influence intelligence and its cognitive components? *Developmental Psychology*, Vol. 27, pp. 703-722.

The analyses of half a million American high school students' data and the light it throws on correlations between IQ and wealth, is to be found in

Ceci, S.J. (1990) *On Intelligence...More or Less: a Bio-ecological Treatise on Intellectual Development*. Englewood Cliffs, NJ: Prentice Hall.

Other studies which show IQ being as a predictor of educational and economic success are discussed in

Bouchard, T.J. (1984) Twins reared together and apart: What they tell us about human diversity. In Fox, S.W. (Ed.) *Individuality and Determinism*, pp. 147-184. New York: Plenum.

There have been many studies of gamblers and a recent Queensland study of what school children know about betting and probability is

Peard, R. (1993) Gambling, with Maths, *set* No.1 1993, item 5.

Other studies are often of undergraduate card players. A good example is

Keren, G. and Wagenaar, W.A. (1985) On the psychology of playing blackjack: normative and descriptive considerations with implications for decision theory. *Journal of Experimental Psychology: General*, Vol. 114, pp. 133-158.

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Appendix

One subject, a 62-year-old crane operator with an 8th-grade education and an IQ of 92, gave the following reply to the question, 'Which horse do you think will win in the next race?' His answers nicely demonstrate an awareness of the need to qualify a horse's final speed by several of the other variables in this case, moves and purse size. (E denotes experimenter and S denotes subject.)

S. The 4-horse should win easy; he should go off 3 to 5 or shorter or there's something wrong.

E. What exactly is it about the 4-horse that makes him your odds-on favourite?

S. He's the fastest, plain and simple!

E. But it looks to me like other horses are even faster. For instance, both the 2-horse and the 6-horse have recorded faster times than the 4-horse, haven't they?

S. Yeah, but you can't go by that. The 2-horse didn't win that outing, he just sucked-up.

E. Sucked-up?

S. You gotta read between the lines if you want to be good at this. The 2-horse just sat on the rail and didn't fight a lick. He just kept on the rail and sucked-up lengths when horses in front of him came off the rail to fight with front runners (i.e., attempt to pass them on the outside).

E. Why does that make his speed any slower, I don't get it?

S. Now listen. If he came out and fought with other horses do you think for one minute he'd have run that fast? Let me explain something to you that will help you understand. See the race on June 6 (pointing to the relevant line of the racing program)?

E. Yes.

S. Well, if the 2-horse had to do all of this fighting (pointing to indications in the program of attempts to pass other horses), he'd run 3 seconds slower. It's that simple. There ain't no comparison between the 2-horse and the 4-horse. The 4 is tons better!

E. I think I see what you're saying. But how about the 6-horse, didn't he do some fighting and still run faster than the 4-horse (pointing to indications of attempts to pass front runners)?

S. Yeah. I like the 6-horse a little, but you can't bet him against this field because he's untried... he's been running in cheap company (pointing to the 6-horse's past purse sizes).

E. Why is purse size that crucial? He's still running faster than the 4-horse and fighting front runners while he's doing it. What difference does the purse make?

S. (Sarcastically) It only makes all the difference in the world, that's all. Do you think for one minute that he can pull those stunts with good horses (pointing to an indication of the 6-horse going around a 'wall' of three horses)? Hell, if he tries to go three-wide in $15,000 company, they'll eat 'em up!

E. What do you mean?

S. You can't do these cheap tricks with horses of this calibre. They'll sit back and wait for him to get even with them on the outside, then they'll speed up and make him stay on the outside. You see, horses of this calibre ($15,000 claimers) can generate the speed to keep you parked outside the whole race. $10,000 claimers don't have the stamina, as a rule, to do that....

E. And the longer you're on the outside, the longer the race you have to run, right? In other words, the shortest route around the track is along the rail and the farther off of it you are, the longer the perimeter you have to run.

S. Exactly. Now with $10,000 claimers, the 6-horse is a different story. He can have it all his way. But there's another horse in this race that you have to watch. Do you know who I mean?

E. The 5-horse?

S. No! He'll still be running this time tomorrow! No, I'm talking about the 8-horse. He don't mind the outside post because he lays back early. Christ, he ran a monster of a race on June 20th! He worries me because if he repeats here, he's unbeatable.

E. Do you like him better than the 4-horse?

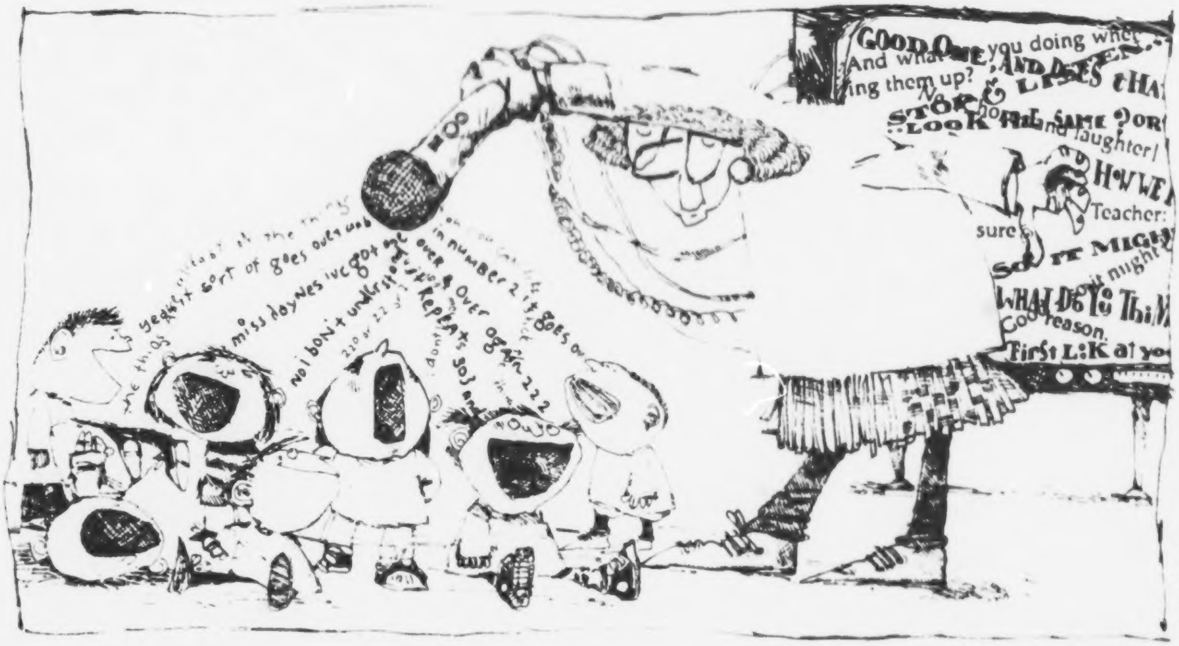
S. Not for the price. He'll go off even money. He isn't that steady to be even money (i.e., 1 to 1). If he's geared up, there's no stopping him but you can't bet on him being geared up. If he were 3 to 1, I'd bet him in a minute because he'll return a profit over the long run. But not at even money.

set
number one 1994

WATCHING ONESELF TEACH

Jo Haynes

HERE IS A MODEL for self-appraisal, an assessment technique more praised than practised. Jo Haynes, in her final year at a College of Education, reflects on a lesson she gave, taped and transcribed. You may disagree with her findings, and even her maths, but you have to admire her courage and openness.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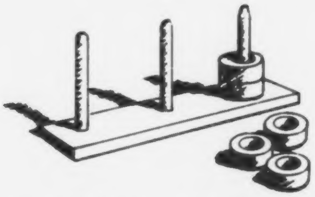
Repeats

Jennifer Lautusi

I DECIDED to tape and transcribe a maths lesson in 1993. The class of 11 and 12 year olds was drawn from three classes who work as a team. I worked with them just for maths, usually using *Young Australian Maths*.

This particular lesson was at the beginning of a change of focus in the work that we had been doing. Previously we had been looking at large numbers, now we began on other number systems. I began with an activity that I knew all children would be successful at: in *Spike*, children are given three counters and an open 'spike' abacus. They have to find as many numbers as they can using two counters, then three. This activity allowed me to keep all children challenged – when a child finished he or she was given more counters. Finding all the numbers using five counters is quite a challenge! The children were then all gathered together and on the board we put up lists of all the numbers they had managed to make in *Spike*. All the children eagerly took part. The next step was to focus their thinking on the patterns that were in the lists:



1st Transcript *(Patterns section)*

NB: Names changed

Teacher:	I want you to look at those numbers and do two things. First (Simon are you looking at the board?) look at any patterns you might be able to see in those numbers. And second, think about why that pattern might be there.

Pause

Teacher: Do either of those two things – see if you can see any patterns in the numbers and think about why.

Put your hand up when you've thought of something – I'll wait for some more people to have ideas. See if you can really think about that second part once you've found a pattern – why might the pattern be there? There's sure to be a reason.

Pause

Teacher: Rachel, can you see any patterns in those numbers up there? Who'd like to put into words what I mean by a pattern? What's a pattern in maths - or in anything? Jeremy?

Jeremy: Yeah it sort of goes over and over again.

Teacher: So it might be something that's repeating?

Jeremy: Yeah repeating.

Teacher: OK, good – what else might it be?

Lisa: One number that's in a lot of things different ways.

Teacher: Good – so it might be a number that you can see lots of times but it looks a bit different?'

Lisa: Mmm.

Another child: In a different position.

Teacher: OK – who would like to share a pattern?

Tevita: In number two it goes 200, 20 and 2 – it keeps going down in tens.

Teacher: Would anyone like to have a guess about why that might be? Any ideas?

James: Because they're all 2s.

Teacher: Right so it's multiplying by 10 each time – yes – good.

Tony: You're moving them up on the abacus.

Teacher: And what are you doing when you're moving them up?

Another child: You're adding a zero.

Teacher: What's the word for all that?

No attempts by children.

Teacher: Can anyone see any other patterns?

Child: You can like – in two you can have digits [numbers] *with 2s in them but you can't have them unless there's a zero.*

Teacher: Good one, and does that work with the others as well? In the 3s -can you only have a 3 with zeros?

No.

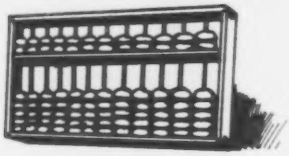
Teacher: Have a look – has that 3 got zeros? That one?

Oh yeah.

Teacher: That 3 has got zeros even though you can't see them – it's like they're invisible.

The discussion of patterns finished soon after this and I questioned the class on things that were important in our number system (using the ideas from the pattern discussion). We discussed place value, important digits, base 10 etc. I then brought out a Chinese abacus.

2nd Transcript *(Chinese abacus section)*



Teacher: Who's seen a Chinese abacus before? We're going to use these today.

Child: Miss Haynes, I've got one.

James: I know how to use one of these.

Teacher: Well you might like to bring it for us tomorrow.

First look at your Student Book p. 13. It says that that abacus is showing 1279. It tells you that. Look at the abacus and work out how it's showing it.

Can you work out how it's showing it?

Children: No. [Chorus and laughter]

Teacher: Think about how we show numbers on our abacus and how it might be similar or different.

Children: [thinking – burble of discussion – lots of *I don't knows.*]

Teacher: Stop and listen. What do you think the first column is showing? What do we call it? Do you think these columns on the left are showing anything? They all look the same don't they?

Child: Yes, but they are used.

Teacher: Are they showing 1279?

Child: No not right now but they will later.

Teacher: Yes – later on they can be used. Who thinks they know what the first column might be showing?

Child: Not me.

Teacher: When we use our abacus, we get an empty abacus don't we and we put counters on it to show numbers. To show two I put one counter and then another [modelling]. Does it look like the Chinese abacus works the same way?

Children: No. [Chorus]

Teacher: So what looks different about it?

Simon: The things are already on.

Teacher: So, if they're already on, what do you think you need to do to actually show a number?

Lisa: Push them up.

Teacher: And what about the ones at the top?

Lisa: Push them down.

Teacher: So you're pushing them into the middle. Now try and see if you look at that if you can tell me how the abacus is showing that number, remembering that they're going into the middle.

Michael: *5 is at the top.*

Teacher: Would you like to say that in a loud voice Michael?

Michael: *Up top are 5s and each time you get more than 5 you put one on top and the remainder down the bottom.*

Lisa: *Ohhhh!!! I get it now.*

Michael repeated his explanation.

Children: *Ohh. Yeah.*

Lisa: *This is fun now.*

Teacher: Has it come clear now Lisa?

Lisa: *Yeah.*

The class was nearing its end. I told them that by next day those who were still a bit unclear about the abacus should make it their job to ask someone and find out. I gave a run down on what we would be doing for the rest of the week, which was work on the Chinese abacus and groups developing their own number systems, these two being linked.

Watching Myself

The transcriptions brought out some interesting points about my teaching; and about maths teaching. I was hoping to focus the children's attention on our number system, therefore I gave them two tasks: 1. to find a pattern, and 2. to explain it. I saw that I *encouraged* explaining (especially as a challenge when children began to put their hands up with patterns), but throughout the discussion I *accepted* those who just gave a pattern without explaining it. This I found allowed all children to be successful in the activity and to participate in discussion. For the same reason I had started with the *Spike* activity: all the children could do it. It focused all of them on what we were discussing and all the children helped make up the lists.

...I am developing in my expectations of children.

I allowed time for lots of children to discover patterns. This, it seems is really important. It is not good to just carry on as soon as the first few children have had something to say. It is important to have extension ideas: those who are ready can think about these.

I also focused on a particular child (Rachel) who was sitting at the back and did not often participate. I specifically asked her how she was getting on with finding patterns and, in case she (and others) needed the concept clarified, at the same time I asked children to explain what I meant by a pattern. It was also a useful place for me to get some idea of the children's understanding of this mathematical concept. I assumed that they would all know what a pattern was, but it is always interesting to hear children articulate what they understand.

Throughout the transcription, what stands out for me is that, although I accepted the answers given and pushed the children further with their thinking (e.g., 'Does that work with the others as well? In the 3s?'), I often repeated what they said or slightly rephrased it. It was useful to discover this, but I am still unsure why I do it. Sometimes it is appropriate (for example, when I am making sure I have understood what the child has said), but at other times I could easily have continued the discussion along the lines suggested by the child without actually repeating what they said. It comes across as though I believe that for something to be meaningful it must be reinforced by the teacher. I do not hold this view!

Tied in with this is the fact that, although the class is having a good discussion, I was very much in the centre of it – asking questions, clarifying, pushing thinking further, etc. I would like to see development of more class discussion with children questioning each other. However, there are reasons why this does not occur often. In this particular case the children are drawn from three ordinary classes for maths and they did not form a normally cohesive group. I saw them only about four times a week so I did not feel as comfortable with them as I might. I was less sure of who to watch for, and of different abilities. There were some children who did not remain on task easily and I found it easier to have all the children together with one person talking at a time; I felt more in control of the situation when *I* was facilitating the discussion. I think I worked hard to ensure that all the children were focused on what we were doing and that all were part of the discussion. However, this is a part of teaching skill that can always be worked on – it is so easy to overlook those not on-task or sitting in a haze of misunderstanding.

The main point I draw from the transcription of the Chinese abacus section is that I managed to gradually clue children into discovering how the abacus worked. I started off with the open task of looking at the abacus in the book and working out how it was showing the number 1279. Gradually I gave the children more 'clues' and focused them on certain points

- to compare the Chinese abacus with the open spike abacus they had just been using;
- to consider what the first column might be showing;
- to compare the abaci by looking at whether they started off 'full' or 'empty'.

It was this last point that finally triggered off an understanding for one child in particular. He gave a really good explanation to the class and within a few seconds there were sighs of understanding from most of the class. This was great – children were listening to a peer, taking it all on board themselves and having it click into place. This was so much more meaningful than if I had said 'This is how the Chinese abacus works – now go and do the exercises on p. xxx.' This process was also helped by the resources I had – lots of open abaci and a Chinese abacus to use as a model.

Origins, Contexts and Purposes

On the whole my maths lessons were going well and I was enjoying them. However, the session before had not gone smoothly – some children had not understood what I thought they had, and I was not organised for this. I felt the children were not enjoying what they were doing and overall I did not feel in control of the situation. I thought a lot about how I could improve for the following week.

I set myself clear learning outcomes, linked lessons together and provided for plenty of discussion. From the discussion I could more easily work out how children were going. I also realised the importance of starting with an activity at which all the children could be successful. With *Spike* they worked in pairs to complete a task they could all do.

I used *Young Australian Maths* as a text and basis for my lesson. I was familiar with it, and the school used it with its Teachers' Guide, Student Book, Activity Book and

Blackline Masters. It fits in well with the teaching style I wanted to develop so I used the Teachers' Guide to develop my sequence of lessons. *YAM* has an emphasis on the hands-on-approach, it uses language and discussion, and allows children to investigate and solve problems. It gave me a base from which I could develop my own objectives and use my own ideas.

I discovered that the philosophy I am developing about maths teaching fitted well with my teacher associate. I was therefore able to get valuable feedback and advice from her. And I was using a style of teaching that the class was familiar with (even if they were not aware of this).

These were whole class lessons where the most important features were the use of concrete materials, discussion and the opportunity for children to describe their discoveries. I was a facilitator and tried to move the children towards discovering what I wanted them to find out. At last I was able to use the investigative approach advocated in my College of Education maths courses.

The new curriculum emphasises that learners take an active part in their own learning – children actively construct patterns and relationships in maths. There is no need for rote learning or drilling sets of rules and procedures. Teachers are facilitators and provide experiences and structures within which children can develop their use of mathematical concepts and processes.

> "... Teaching no longer seems quite such an overwhelming task."

The children worked first in pairs and then the whole class participated in discussion. If necessary I would have worked with a group of children who needed extra attention, but the class was not grouped for ability. The high maths-achievers from the team were all together in one class, but even so there was a range of abilities in my class. I like to do as much as possible with the whole class so that children are learning from each other and all benefit from the understanding each brings.

Assumptions, Personal Beliefs and Theories

I believe that children should be enjoying learning and challenging themselves. This is particularly relevant to maths where so many people (both teachers and children) have a negative attitude which gets in the way of their learning (or teaching!) I firmly believe that maths can be stimulating and satisfying and that all children can be successful at it. I really felt that in this particular lesson I made it: all the children were successful with the abacus and found patterns within our number system. Then it was great to see them use this knowledge to discover for themselves how the Chinese abacus worked. Seeing that moment of understanding was lovely and children were motivated and interested in what they were doing. I even had children coming up to me outside to ask if we were 'doing the abacus again'!

Process is very important, not just content. Children were focusing on patterns, learning to express ideas, listening and responding to others, applying logical thinking to a problem using their own language and the language of mathematics. These are all skills included in the mathematical processes strand of the new curriculum.

Children need to be exposed to a variety of inputs and resources. The lesson used concrete materials, discussion, teacher input, working with others, input from peers, written resource, class compilation of findings. A balance of these (and other) resources aids children in their learning and helps to make maths stimulating and interesting. I believe that concrete materials are crucial in developing children's understanding of mathematics and that discussion helps to break down negative feelings about maths. Allowing them to articulate their ideas and use their own language helps them make maths their own. It also helps link it with other areas of the curriculum.

Children must make sense of their world and what they are learning – activities should be building on what has gone before and as many opportunities as possible made for children to explore, articulate and discuss linkages. This must be within a supportive atmosphere where children can take risks. There must also be plenty of time and activities in which the children can consolidate their knowledge. Children can be guided towards making linkages but when it comes down to it, things must click in their own minds. Teachers cannot learn for children!

Carrying the Lesson Forward

In following lessons children consolidated their discoveries by working with me and doing independent work from their *YAM* Activity Book. Then they worked in groups to invent their own number systems. In group work children share their knowledge and work together to solve problems. I would have liked to do more of this in my teaching but time constraints were a problem. The day was structured with periods and there was so much to get through!

If I had my maths class all day I could have spent more time talking about the patterns and allowing them to develop their own investigations. As it was, I knew I had to get on to other work before the bell went! An extra pressure comes when the children are working on different tasks and exploring their own investigations. At present I am developing in my expectations of children (behaviour and work) and I still find it difficult to monitor children working at diverse tasks. I need to set clear guidelines of standards of behaviour and work produced. I also need to develop conference times to see children.

The Children's Responses to Me as a Teacher

I believe that children respond to my openness and acceptance of their ideas. My class got used to the fact that I liked lots of discussion and that I liked to speak to them as a whole class. They responded to the fact that I accepted their answers and helped them to make linkages, partly through my questioning and partly through my asking them to clarify why they said what they said. They appreciated my use of concrete materials and the fact that I tried to have everyone achieve success. Making learning interesting has certainly become a focus for me as teaching no longer seems quite such an overwhelming task! The taping and analysing of a lesson has proved a very useful exercise. I was quite impressed with the ways that the lesson did fit in with my beliefs!

Notes

MS JO HAYNES was a student in the 2-year course for graduates at the Auckland College of Education in 1993, when this work was done. She is now a teacher at Manurewa East, Scotts Rd, Manurewa, and may be contacted there.

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item 13

set
number one 1994

Increasing Students' Motivation to Learn

Jennifer Archer

THERE ARE EXTREME METHODS for increasing children's motivation to learn: competition, and laissez faire. Research into what children themselves prefer points to a middle way: focusing their attention on 'improvement over time'.

Nicola Belsham

Increasing Students' Motivation to Learn

Jennifer Archer

What is the best way to teach?

What can we do in classrooms to make students eager to learn?

THERE ARE TWO EXTREMES. First, there is the 'winners are grinners' classroom based on the philosophy that competition brings out the best in students – we strive for the thrill of winning or we strive to avoid the shame of failure. Then there is the 'learning is lovely' classroom, resulting from the belief that as human beings we are naturally curious and keen to learn – we will beaver away happily on our tasks needing neither the incentive of juicy carrots nor the fear of big sticks. Personal experience (aging does have its benefits) suggests that neither extreme is likely to work. Let's begin with the competitive end.

Competition

Research is highlighting a problem that emerges in highly competitive settings: students become overly concerned, at times obsessed, with how much ability they have. It is students' *perception* of how smart they are that gets in the way of their mental health, not some objective measure of smartness – and at times there is little relation between the two. Perceptions are important because it is our perceptions of how things are, not how things really are, that affect how we think and behave.

> "...Students become...obsessed with how much ability they have."

Young children will often say that trying hard will make you smarter. But most students in upper primary school and beyond see ability as a fixed commodity, particularly ability in a subject such as mathematics: you can have a lot of it, an average amount of it, or very little of it, and no amount of trying will increase the amount you have. In competitive situations students tend to see ability as the major reason for success, and lack of ability as the major reason for failure. Sometimes this pattern may be obscured because students say lack of effort was the major cause of their failure. But the reason is still there underneath: for example, a student might say: 'I failed maths because I didn't try – I figured there was no point trying because I don't have any ability in maths.'

What happens when students are put into highly competitive situations? Are they eager to learn or are they apathetic? Do they enjoy their work or do they see it as drudgery? Will they persist when they encounter problems or will they give up too readily? Will they have a go at more difficult, challenging tasks or will they stick with easy work?

Carol Dweck makes a distinction between what she calls an *adaptive* approach to learning (for example, enjoying, persisting, accepting challenge) and a *maladaptive* approach to learning (disliking, giving up, avoiding challenge). In a competitive setting, students who see themselves as among the best students in the class (their *perception* of their ability is high) are likely to display an adaptive approach to their work. However, students who see themselves as among the least able students in the class (their *perception* of their ability is low) are likely to display a maladaptive approach.

> "...Competition means a few winners emerge from a large pool of losers."

The nature of competition means that a few winners emerge from a larger pool of losers. If students believe that success means coming top, and that it is the smart students who come top, then there is little chance for less able students to make it into the winners' circle. From the student's perspective, there is no connection between effort and success, even though the teacher may ramble on about the virtue of hard work. So it is not surprising to see the winning students enjoying their work, persisting in the face of difficulty, and accepting challenging tasks (though some students may not do this for fear of losing the top position), while the students who get low marks announce that they are bored, they hate school, and they can't wait to leave.

Improvement

What might be expected to happen in a different sort of classroom, where the teacher's philosophy is that students' motivation to learn is greatest when there is an emphasis on individual progress? Research suggests that in such a classroom students are not as concerned with how smart or how stupid they are, as they would be in a competitive classroom. The researchers find this reflected in the reasons children give to explain their successes and failures: in a non-competitive classroom they are more likely to say that they succeeded because they worked hard or they had a good teacher, and they are more likely to say that they failed because they didn't work hard enough or that they went about studying the wrong way. That is, effort is linked with success if success is defined as personal improvement. It makes sense for students to attribute failure to not trying hard enough rather than to not having enough ability because they have more control over how hard they try than over how much ability they have.

What happens to students' notions of how smart they are or how stupid they are in a classroom where the teacher emphasises individual progress? There is evidence that even those students who see themselves as not very bright show an adaptive approach to learning when progress rather than winning is stressed. In such a class they enjoy their work, they persist when the going gets tough, and they are willing to tackle what are for them difficult tasks. This is in contrast to students who don't see themselves as very bright and find themselves in competitive classrooms: they aren't motivated to learn and so can be very difficult to teach. If success is defined as improving or meeting an absolute standard then everyone in the class has the chance to be successful. All they have to do is to work hard enough, or get help from other students (or the teacher) if their effort isn't paying dividends (because they're working hard but in the wrong way).

Learning Strategies

There is another spin-off from putting students into mastery-oriented classrooms: students who feel that their teacher is encouraging them to focus on their own progress report they use strategies that help them understand the subject matter. These are strategies such as (1) putting time into planning how to do a task, (2) trying to connect new information to what has been learned previously, and (3) checking to make sure they understand new information. Students who use these strategies want to develop a 'deep' or genuine understanding of the subject. This is different from a 'surface' understanding of a subject, skimming across the top in an attempt to pass an assignment or an examination. Students concentrating on surface learning are likely to use strategies such as rote learning or trying to 'tip' which questions will appear in the exam.

> “...From the student's perspective there is no connection between effort and success.”

A Study

Research I have done supports these findings. I visited a high school on the NSW Central Coast with a middle to lower socio-economic intake, and asked 241 students, aged between 14 and 16, to complete a questionnaire. Each student was asked to think about a particular class they attended (for example, Year 9 [NZ Form 4] Mathematics, or Year 10 English, or Year 11 Modern History...) and to indicate whether they thought the teacher was encouraging students to be mastery-oriented (emphasising individual progress) or to be performance-oriented (emphasising competition). Students who felt the teacher was emphasising a mastery approach (1) liked their classes more, (2) attributed their successes to good teaching but did not attribute their failures to poor teaching, and (3) reported using more effective learning strategies.

Moreover, analyses showed that it wasn't just the students who saw themselves as among the best in the class who liked the class and used good study strategies – results were similar for students who rated themselves as having little ability in the subject. The comparison results for students who perceived their teachers to be encouraging competition were not as strong. I suspect that this might have something to do with the less competitive atmosphere in Australian schools than in schools in the United States where similar research has been carried out.

> “...If success means improving, everyone has a chance of success.”

Because the study was a correlational one not an experimental one, I can't be sure that it is the teachers' behaviour in classrooms that causes students to think and act in particular ways (though Carole Ames and Carol Dweck have done experimental studies in this area with similar results). There are ethical problems with carrying out experimental studies: is it acceptable to put students into a situation (in this case, in competition) where you expect that at least some of them will end up feeling inadequate and unhappy?

Conclusion

There are advantages in encouraging students to focus on improvement-over-time (rather than performance-relative-to-others). There are difficulties as well: the family and other influences in schools may be working against this approach. Most of us would agree that the family is the greatest influence on students' motivation to learn. As teachers we come a poor second. If children see education as something to be endured until they are free to leave, then there is a hard road ahead for us. Also, teachers are small cogs within large and powerful systems, especially the high school system. Students are urged to fight for a place at university or for some other form of tertiary training. This is a competition beyond our control.

For all this, schools and teachers can make a difference. The first step is to move students' attention away from the question 'How smart am I?' and towards the question 'How hard will I have to work to do this task?' We need to convince all students that there really is a link between effort and success.

Notes

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Competition

Research showing how students become overly concerned about how much ability they have is extensive. See for example:

Ames, C. (1992) Classrooms: Goals, structures and student motivation. *Journal of Educational Psychology*, Vol. 84, pp. 261-271.

and

Dweck, C.S. (1986) Motivational processes affecting learning. *American Psychologist*, Vol. 41, pp. 1040-1048.

and

Nicholls, J.G., Ping, C.C., Lauer, J. and Pataschnick, M. (1989) Individual differences in academic motivation: Perceived ability, goals, beliefs, and values. *Learning and Individual Differences*, Vol. 1, pp. 63-84.

That students in a competitive environment see lack of ability (not lack of work) as a reason for failure, is described in

Ames, C. (1992) Classrooms: Goals, structures and student motivation. *Journal of Educational Psychology*, Vol. 84, pp. 261-271.

and

Stipek, D.J. (1993) *Motivation to learn: From theory to practice (second edition)*. Boston: Allyn and Bacon.

Carol Dweck's distinction between adaptive and maladaptive can be found in

Dweck, C.S. (1986) Motivational processes affecting learning. *American Psychologist*, Vol. 41, pp. 1040-1048.

Improvement

Research showing that students in a classroom that emphasises individual progress are less concerned with how smart they are can be found in

Ames, C. and Archer, J. (1988) Achievement goals in the classroom: Student learning strategies and motivation processes. *Journal of Educational Psychology*, Vol. 80, pp. 260-267.

That even children who see themselves as not so bright can in non-competitive classes enjoy their work, persist, and tackle difficult tasks, is a research finding, and can be found in

Elliott, E.S. and Dweck, C.S. (1988) Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology*, Vol. 54, pp. 5-12.

Learning Strategies

Students who feel that their teacher is encouraging them to focus on their own progress report that they use strategies that help them understand. See

Ames, C. and Archer, J. (1988) Achievement goals in the classroom: Student learning strategies and motivation processes. *Journal of Educational Psychology*, Vol. 80, pp. 260-267.

and

Meece, J.L., Blumenfeld, P.C. and Hoyle, R.K. (1988) Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology*, Vol. 80, pp. 514-523.

A Study

For a full report of this study see

Archer, J. (1992) *Students' perceptions of classroom climate: Implications for motivation*. Paper presented at the combined AARE/NZARE annual meeting, Deakin University, Geelong, Australia, November.

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set
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Thinking about Thinking

A TRAINING PROGRAMME IN PROBLEM-SOLVING STRATEGIES

Chris Perry

TEACHERS can successfully encourage learners to be better thinkers. Research whilst teaching eight-year-olds reveals the techniques for teaching metacognition and leads to conclusions about how to do it well.

Introduction

TEACHERS CAN ENCOURAGE LEARNERS to be better thinkers. Being a better thinker means being aware of how we go about learning and how we can control our learning. 'Thinking about thinking' or 'knowing about knowing' is called **metacognition**.

Metacognition involves, firstly, being **aware** of (a) your motives, (b) your abilities, and (c) the demands of the learning task. Secondly, metacognition is about (d) **control** and regulation of your cognitive activities. Control allows you to select the most appropriate strategies to handle a task. For example, you have metacognitive knowledge about the task-demands when you are aware that you need different study preparation for an essay exam than for a multiple-choice exam. You show control and regulation when you also plan an approach for studying, monitor your studying and evaluate the effectiveness (check the exam results!).

Most research suggests that learning to think about thinking does not come naturally. It is something that we need to learn and practice. Teachers can successfully teach it and all learners can consciously work on their own strategies, especially through self reports, that is, by 'thinking aloud'.

Some children learn faster, and retain their knowledge better, than others. Researchers try to measure and explain this 'learning effectiveness' or study the 'good learner'. Over the years a great deal of attention has been given to the measurement of the time children spend on learning tasks. It was suggested that students who gained the highest academic scores were those who had spent most time fully engaged in the task. So it looked simple – to get more learning simply spend more time on the task. However, the school day is not infinitely expandable, so teachers were told to focus on motivating children to stay 'on-task'.

More recent research has suggested that merely investigating time-on-task does not give us enough information for identifying effective learning. What is important is *how* the learner is utilizing that time. A simple study of the amount of time spent on a task does not, for example, identify the learning strategies the child is using. Furthermore, these strategies are usually hidden – they are not directly observable.

Thinking aloud helps us as learners to be aware of our own learning processes. You can be trained to think aloud, and doing this can assist teachers and researchers too. When helping someone else to think about their thinking there are questions which help.

Strategy awareness questions: 'Do you think this problem will be hard or easy to do?' 'What does a person need to be good at problems like this?'

Strategy control questions: 'What is the first step you need to take to solve this problem?' 'What is another way you can solve this problem?'

Strategy use questions focus on the specific strategies the learner is using: 'Why did you start with this letter?' 'How did you know that you needed to subtract before you multiplied?'

In ***set*** No.2, 1984, Helga Rowe described how we can assist students to be effective learners by identifying their problem-solving strategies and matching those strategies with requirements or problems. As teachers we often teach children *what* to think instead of teaching them *how* to think; the teacher's role **should** be to teach thinking. Schools have policies on Reading and Mathematical skills; should they not also have a policy on Thinking skills?

In school-based research in Melbourne I looked carefully at how metacognitive skills affected problem-solving.

The Study

First, here is the brief outline of the research, and then some additional information with examples of the thinking aloud discussed.

I chose to work with 8-year-olds since this appears to be the age at which problem-solving strategies begin to appear. The children were from a primary school in the Eastern suburbs of Melbourne. I had been working in the school for some time on other projects and the children were quite used to seeing me around. I chose 36 children, giving them all a Peabody vocabulary test and then dividing them up according to the results into three reasonably equal groups of 12.

Group 1 acted as the control group, and played the games (attempted to solve the problems) but were given no help.

Group 2 were given comments (encouragement and motivation) designed to keep them on task but no comments about strategies which might help them solve the problems.

Group 3 were the metacognitive training group, and were given help with examining their own strategies.

I worked with the children one-to-one and presented the problem as a game, using *Scrabble* letters. The objective was to make as many small words as possible from the letters of a long word. This is a common game in the puzzle sections of newspapers and popular magazines, usually alongside crosswords and number puzzles. I asked them to play three times using words like CONSERVATION, RESERVATION, BUTTERFLIES; from conservation you can get, for starters, a, an, at, on, no, to, too, con, vat, tan, not, net, ovation... and, with a strategy to help, 40 or more.

For *Session 1*, the children in the metacognitive training group were given the task, and as well, were questioned in ways that encouraged them to be aware of strategies, of strategy control and strategy use. They were also encouraged to 'think aloud' during the game. In *Session 2* the researcher showed them an effective strategy and it was discussed and practised by the children. In *Session 3* the task was given without prompting or intervention.

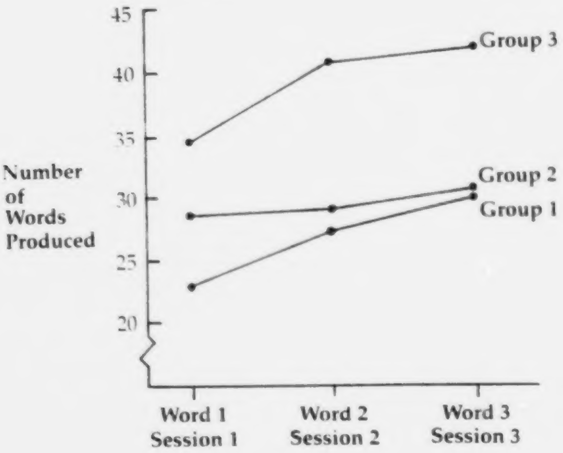
For all the children, the data collected was a simple count of the number of words the child found inside the long word.

Results

The average performance of each group (controls, those just encouraged and those given help) is summarised in the graph.

Figure 1

The Performance of Each Group on Each Word



All groups showed improvement. However Group 1 (controls) and Group 2 (encouragement only) by the third game could still not manage to find as many small words as Group 3 found in their first try. This reinforces how positive metacognitive awareness is in problem-solving.

The Children and Their Strategies

A number of the children in Groups 1 and 2 were aware of (and used) efficient problem-solving strategies. However in Group 1 very few of the children made any spontaneous comments and only three made any comments about the task. They said, for example,

One more word to go till 20.	Jonathan
Does Venus have a 'u'?	Michael
How do you spell 'flake'?	Aaron

Both Michael and Aaron were using an inefficient strategy: thinking of a word first and then seeing if it fitted the letters.

Group 1 children used other inefficient strategies, too; for example, Andrew and Katie continually looked around the room for words: chair, window, chalk, duster.... and then came back to the *Scrabble* letters to see if they fitted. Many of the children in this group did not touch the *Scrabble* letters in any way and in fact, Jeremy and Jonathan did not touch or manipulate the letters on any of the three occasions. They thus denied themselves the opportunity of 'seeing' words when letters are presented in different combinations. Several of the children did use some task-efficient strategies; for example, Jovani used two-letter combinations such as 'ag', 'og' and 'ig' in a sustained manner. Heidi used the starting letter 'r' and three-letter combinations '-old-' and '-are-' to create a long list of words.

These children's attempts at problem-solving were explicit enough to show that they were using particular strategies – and getting success. But evidence that they knew what they were doing – that they were aware of and consciously using those strategies – was much less clear. Overall, the lists of words produced by this group appeared to be a random selection; their strategies, whilst evident, were not being controlled. The strategies appeared, in most cases, to be used for one or two words and then abandoned.

> "...Thinking aloud helps us be aware of our own learning processes."

Group 2, probably because the researcher talked to them a lot, were much more vocal. Many children spontaneously announced the strategies they were using:

I need an 's' like before.	Clare
If I had a 'double e', that's good for words. *Putting some letters together is good.*	Ben
I'm just experimenting. 'Coon'. Can I make 'toon'?	Linda
From one word 'tear' I made five words.	Craig

(He did not however use this word-within-word strategy again.)

That long word's too hard. I'll look at the words I've made to make more.	Craig
If I turn 'tin' around I've got 'nit'.	Amanda
I'll put the big word together again. I might see more.	Craig

There was evidence of strategies being used and controlled; for example, Amanda persisted with word-within-word – 'not', 'note', 'no', 'ten'. Daniel also persisted in the use of this strategy. Rodney found many of his words by constantly re-arranging the *Scrabble* letters into boxes. Linda arranged hers into crossword format.

There was also evidence of the use of inefficient strategies.

I thought of words that didn't fit.	Craig
If I had 'y', 'o', 'u', I could make words.	Ben

Amanda turned her letters upside down to see if she could make new letters.

Group 3 comments, many of them being 'thinking aloud', show strategy awareness, strategy use, and strategy control. Strategies they understood:

(a) word stems

Two letters go together. [Whilst using '-it', '-ot'.]	Jeffery
I put two letters together. [Whilst using '-ar'.]	both David and Alham
I join two letters that go together.	Mersina

(b) vowel combinations

Some vowels go together. [Whilst using 'ea', 'oa'.]	Yasmine
These two go in middles. [Whilst using 'ea'.]	Mersina

(c) plural form

I can add an 's' to everything.	both David and Yasmine

Jesse also 'discovered' this strategy about halfway through his first game and with great delight went back and added an 's' to appropriate words and announced

I've made twice as many!

Reanna discovered 's' can go at the beginning of words already produced, like s/car, s/tar, s/oar.

'S' is a good letter.	Amanda

(d) one word stimulating another

One word reminds me of another like 'train' and 'rain'.	Max
One word 'thinks' of another. [Producing cave, ave.]	David
There's words in here. [Whilst making east, eat, seat.]	Mersina

It's like a ladder. [And he produces in a vertical form – set, seat, eat, at, rat, cat, sat.] Jesse

and stimulation through sound

One word helps another, like noon and coon.	Jesse

and through meaning

Like ice and cone.	Karen

and through previous experience

I come from there – Soviet.	David

(e) using each single letter of the long word in turn to start a new word

I'll start with the first letter.	Max
I could start with each letter.	Alham

Some of the children also revealed less efficient strategies

You can look round the room.	Max
I wait for words to pop out.	Jesse
I just see words and *I think of people I know.*	Fiona

One child, Karen, did not touch the *Scrabble* letters at all and appeared to find it difficult to answer the questions relating to her own strategy awareness.

Following the training session (the second session), 7 of the 12 children used the strategy which had been shown to them in a sustained manner and several of these children extended it. For example, Jeffery, who had been shown how to use 'ea' then used 'oa'.

That's yours, [pointing to 'ea']
that's mine [pointing to 'oa'].

David made 11 words using 'ea'.

Jesse, whom I had shown how to use two-letter combinations like 'im', 'am', 'at', produced his own combinations in the 3rd session, such as 'og', 'on', and 'ag'.

Fiona, who had had rhymes and sounds given to her as models, in a loud singing voice produced 'ring' 'rang', 'ding', 'dong' (and had me write them twice while she sang them again!).

> "...We often teach children *what* to think instead of *how* to think."

Whilst not using the strategy I showed her in a productive manner, Yasmine produced several other strategies of her own, ones that she had not used previously, and showed that she was aware of their usefulness:

I wish I'd seen that 's' before.'
'-and' and '-end' go on the end. [Amid giggles.]

Several of the children recalled and re-used strategies that they had found effective in session one.

Here's a ladder. [Again in vertical form – island, and, land, lands.]	Jesse
There's that 's' again.	Reanna

Several of the children remarked on their improvement, showing that they were monitoring their own performance.

I've made more than the first one!	Alham
I think I'm getting better.	Mersina
Count it up, I think it's more.	Stuart
That 's' makes a lot of words.	David
I don't think that 'v' will be very good.	Reanna

There were some strategies nearly all the children used. However, there were different strategies which were used by some but never by others. There were also some strategies that were under-used.

We can make a descriptive measure of strategy-use by checking how often a child created more than three consecutive words using just one particular strategy. I did this and got some interesting observations. Looking at the experimental group in their final session, almost all of the children used vowel combinations to create words e.g., 'ea' can be used to create pea, eat, peat, and so on. Eleven of the children used two- and three-letter endings such as 'ing', 'ig', 'og'. Only four of the children used the strategy of making words plural with the letter 's' and only one child attempted to create words by using the letters of the long word in order, as initial starting letters.

I've done some 'd's, I'll start with 'r' now.	Stuart

Through their 'thinking aloud', we can see how the Group 3 children were aware of effective strategies; through their performance we can see their ability to use and control those strategies.

> *But you see,* said Jesse, stabbing at my page with a very grubby finger, *there's that 's' I found that other time. It doesn't matter what the word is, with that 's' I can make lots and lots of words – more than anyone!*

Conclusion

This study clearly indicates that encouraging metacognition has a positive influence on children's performance. Thinking about the way they think, knowing about what they know, increases their ability to develop and to control efficient problem-solving strategies. Providing an environment where learners are encouraged to talk about what they know (and make predictions about what they may need to know) increases their control over those thought processes and thus control over their own learning.

Training in the use of appropriate strategies, along with the opportunity to explore, identify and explain how a particular task is completed, improves performance. This metacognitive awareness allows learners to guide their own learning. This was clearly indicated by the children who, following a training session (session 2), were able to use appropriate strategies successfully without further support or instruction.

> "...Simple practice led to improved problem-solving."

It was also clear that some children were aware of strategies that other children did not know about. This suggests that children sharing what they know about thinking – sharing metacognitive awareness – helps the less efficient learners, so must prove profitable in the classroom.

There was ample evidence that simple practice led to improved problem-solving, but it was also evident that teachers have a role to play. Teachers can assist metacognitive awareness by helping learners to identify which strategies are relevant to particular tasks. Then they can encourage the learners to select and successfully implement those strategies. Teachers can provide an environment where students value effective problem-solving skills, and want to acquire them.

Teachers can support learners by including in discussion of any topic the type of questions that will encourage learners to think aloud about (to monitor) their problem-solving strategies. This should help children develop, as part of their learning process, the ability to self-question.

This study involved only a short-term intervention for a particular task and therefore results cannot be generalized too widely. It may be that the strategies I induced in the training sessions will not persist. Learners may need more time to learn the strategies, time to master their use and time to monitor their effectiveness. This study paid attention to a very specific area of metacognition and focused on the skills involved in a specific language 'game'. Further work with children might assist them see that a particular cognitive strategy, whilst being well suited to one task, may not be suited to another.

The lesson is that, providing a learning environment that promotes metacognition (by enhancing the learner's awareness, use and control of their own problem-solving strategies) is important for efficient and effective learning.

In your own classroom

It is very encouraging to know that simple tasks, such as this 'scrabble' word-finding task, presented in the right way so that lots of metacognitive thinking goes on, will have quite dramatic results. If you try it out and find it is successful in your class you will find more ideas, and techniques, and different games, at different levels, in books, including

Perry, Chris (1994) *Thinking it Through: Activities to Develop Good Thinking Skills*. Melbourne: Oxford University Press.

Notes

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Flavell was one of the earliest researchers to use the term metacognition. He states that metacognition has a core meaning of cognition about cognition. Flavell defines metacognition as

> *One's knowledge concerning one's cognitive processes and products... (and) ...refers to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects on which they bear, usually in service of some concrete goal or objective.*

Flavell gives an example of what he sees as metacognition in action -

> *I am engaging in metacognition... if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as fact; if it occurs to me that I had better scrutinize each and every alternative in any multiple choice task situation before deciding which is the best one; if I sense that I had better make a note of D because I may forget it....*

The ideas of Flavell can be further studied in

Flavell, J. (1976) 'Metacognitive aspects of problem solving'. In L. Resnick (Ed.) *The Nature of Intelligence*. New Jersey: Erlbaum.

and

Flavell, J. (1977) *Cognitive Development*. New Jersey: Prentice Hall.

That all learners can consciously work on their strategies, especially through 'thinking aloud', is discussed in

Rowe, H. (1986) 'Parental roles in developing metacognitive skills'. Paper presented at the 2nd Australian Family Research Conference, Parkville. Institute of Family Studies, November.

Researchers try to measure and explain why some children learn better than others. Those who are aware of (and able to employ) appropriate problem-solving strategies are effective learners. A good discussion of this is in

Biggs, J. (1986) *Student Approaches to Learning and Studying*. Hawthorn, Victoria: ACER.

An important early study of time-on-task is

Rosenshine, B. (1979) 'Content, Time and Direct Instruction'. In P. Peterson and H. Walberg (Eds.) *Research on Teaching: Concepts, Findings and Implications*. Berkeley: McCutchan Publishing Corporation.

Teachers and researchers can be helped when children are trained to think aloud, and the pupils helped when we have identified their problem-solving strategies and matched those with their requirements. This can be found discussed in

Rowe, H. (1984) 'Problem Solving Strategies', ***set*** No. 2, 1984, Item 13. Melbourne: ACER and Wellington: NZCER.

That 8 years old appears to be the age at which children develop problem-solving strategies is discussed by

Brown, A., Campione, J. and Day, J. (1981) 'Learning to Learn : On Training Students to Learn from Texts', *Educational Researcher*, Vol. 10, No. 2.

The data from my study were analysed using the t-test and one-way analysis of variance procedures of SPSS-X version 2.2. (The detailed analysis is available from me.)

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set
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Critical Thinking

Helga Rowe

WHAT IS **GOOD** THINKING? It is always a pleasure to come across creative thinking; but we tend to look askance at critical thinking – it seems a bit akin to criticism. However, as teachers we know we must encourage children to question and question and question again. Critical thinking is here carefully analysed, and research adds further insights.

Nicola Belsham

1. Critical and creative

WHAT IS **GOOD** THINKING? Sometimes it is quick thinking – catching the ball, ringing the fire brigade. But quick thinking in class may be just showing off, a flair for mental arithmetic, or something we can leave to the computer – which is even faster and doesn't get bored. Is good thinking being logical? Sometimes. Is good thinking being rational, reflective, productive? Sometimes. But usually, in school, we are looking for *critical* thinking and *creative* thinking.

Critical and creative thinking are not of the same kind as thinking in problem-solving and decision-making. Both critical and creative thinking add an extra something - **quality**; as we solve a problem or make a decision we do it more or less creatively, more or less critically.

People tend to view critical and creative thinking as opposites: critical thinking evaluates ideas and actions that creative thinking has generated. Yet, the two types of thinking are not opposites, they compliment each other and even share many attributes. All *good* thinking involves both the assessment of quality and the production of novelty. Critical thinking generates ways to test assertions, creative thinking examines newly generated thoughts to assess their validity and utility. The difference is not one of kind but of degree and emphasis.

Nor are critical thinking and creative thinking opposite ends of the same continuum: highly creative thinking is often highly critical, and vice versa. For example, a student working on an essay might think imaginatively in choosing a way to present an argument:

> *Rather than writing a traditional essay, I think I'll write this as a conversation between two political leaders.*

At the same time this student might think objectively about the information he/she is presenting in the essay:

> *Let me see, is what I am saying really accurate? What is my source on this issue? How reliable is my source? Should I put in a reference, or can I assume that this is common knowledge?*

Even a non-argumentative essay's message will be good only to the extent that the writer imaginatively ties it into experience (i.e. thinks creatively) and assesses that experience critically. (And getting the message to the reader will involve assessing the writing critically, cutting out inappropriate bits, highlighting the important bits, and so on.)

2. Defining critical thinking

In the past critical thinking has often been defined narrowly, for example, as *assessing the accuracy of something*. Nowadays it is defined more globally:

> Critical thinking ... is a practical reflective activity that has reasonable belief or action as its goal. There are five key ideas here: *practical, reflective, reasonable, belief* and *action* ... Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do.

I am sure that you will agree that this broader interpretation is more in keeping with general usage and it has creative components.

Just as being able to play the piano does not guarantee the disposition to do so, having certain thinking skills does not mean that one will actually use them. Teaching *good* thinking means more than training students in particular thinking skills, it also means helping students to be disposed to think creatively and critically in appropriate contexts. So, critical thinking involves both dispositions and abilities of the following kinds:

"...Both critical and creative thinking add an extra something – **quality**."

Dispositions
Being open-minded; seeking a clear statement of the task, question or assertion; seeking reasons; trying to be well informed; using credible sources and disclosing them; taking into account the total situation; trying to adhere to the main point; keeping in mind the original or basic concern; looking for alternatives.

Abilities
Listening to others; interacting with others; focusing on a question; analysing arguments; asking and answering questions of clarification and challenge; judging the credibility of a source; observing and judging reports; deducing and judging deductions; inducing and judging inductions; making and judging value judgements; defining terms and judging definition (three dimensions); identifying assumptions; deciding on an action.

3. Assumptions

Here are some of the assumptions made by teachers who encourage critical thinking in their students:

1. There are strong individual differences in the ways my students think and learn; what works for one student may not work for another.
2. Students may ultimately learn to think critically, but not because the teacher taught them. In a very real sense, students must teach themselves to think critically, that is, they must find out what methods of problem-finding and problem-solving work for them. All the teacher can do is to provide every possible means to enable this self-instruction to take place.
3. Some teachers are so used to scoring *products*, and having the attitude *what really counts is the correct answer*, that they ignore the processes which are taking place. In critical thinking, it is the thought *processes* that count. Very often there is no best way to think, that is, no correct answer. Ultimately, students who think well will be in a position to generate good answers - however, good answers are not necessarily the result of good thinking.
4. Traditionally, thought was regarded as something that originates in the individual's *mind*, that is, *inside* the individual, and is then expressed socially. More recently, we have come to recognise the importance of social interaction in the formation of thought. To a large extent, thought emerges as a social process and is 'internalised' by the individual only after it has been expressed socially. A substantial portion of our ability to think originates *outside* ourselves. Interaction and interchange of ideas in discussion with others is essential.

   In our society, there is still a tendency to value most those individual efforts of thought which yield a concrete (often written) product. This does not provide the best basis for teaching critical thinking.
5. To enhance critical thinking we need to serve not strictly as teachers, but as models and facilitators. Class discussion is not a peripheral part of teaching learning to think critically, it is central. In critical thinking, discussion is a legitimate and important end in itself, because ideas are produced. The group produces the best possible collective product. (Have you ever noticed how hard it is for members of a group to identify who first had a particular idea?)

   As teachers who encourage critical thinking we abandon such assumptions as:

   > The teacher is the trainer and the student is the learner;
   >
   > Critical thinking is a task for the student, and (in class) only for the student;
   >
   > What really counts is the correct answer;
   >
   > Class discussion is primarily a means to an end.

4. What are we trying to achieve?

The first objective is to make our students aware of the fact that they (the students), and only they, are in control of what and how they think, how they go about a task, act, learn, and study.

Tasks used in the practice of thinking skills generally move from simpler to more complex, from more concrete observable to abstract dimensions, and from an emphasis on working with known content towards creating or inventing new, previously unfamiliar ideas and approaches. Some aspects of critical thinking appear to develop slowly and as a result of experience, but their development is facilitated by tuition and practice.

There is no generally agreed list of essential thinking skills. But there are many, overlapping lists of dispositions and abilities which can be regarded as essential components. Some can be developed in the early years of schooling. Ten- and eleven-year-olds can be made aware of their own thought processes and can monitor and control their thinking to some extent. More sophisticated aspects of critical thinking need experience in multiple content areas and contexts more readily available in secondary school. Components of critical thinking should probably be introduced in limited number at each year level, and, ideally, their application should be practised across all subject areas. Try some of the processes that follow but do not try them out of context – use them to achieve some real aim or purpose.

5. Learning Goals in Critical Thinking

Dispositions

Like attitudes, dispositions are highly general operating principles. When a person is able and disposed to do something, that is what they will do, if the occasion arises.

1. Seek a clear statement of the problem, task, thesis, or question;
2. seek reasons;
3. try to be well informed;
4. use credible sources and mention them;
5. take into account the total situation;
6. try to remain relevant to the main point;
7. keep in mind the original or basic concern;
8. look for alternatives;
9. be open-minded;
   - consider seriously other points of view than your own;
   - reason from premises with which you disagree, without letting the disagreement interfere with your own reasoning;
   - withhold judgement when the evidence and reasons are insufficient;
10. take a position (and change a position), when the evidence and reasons are sufficient to do so;
11. seek as much precision as the subject permits;
12. deal in an orderly manner with the parts of a complex whole;
13. be sensitive to the feelings, levels of knowledge, and degree of sophistication of others;
14. use your critical thinking abilities.

Abilities

Basic clarification:

1. focusing on the question;
2. analysing arguments;
3. asking and answering questions of clarification.

Basic support:

4. judging the credibility of a source, criteria, etc.;
5. observing and judging reports.

Inference:

6. deducing and judging deductions;
7. inducing and judging inductions;
8. making value judgements and judging value judgements.

Advanced clarification:

9. defining terms and judging definitions;
10. identifying assumptions.

Strategy and tactics:

11. deciding on action;
12. interacting with others.

Subject areas

In mathematics and science classes, one might focus particularly on the identification of the task, levels of explanation, determining additional information required, alternative solution paths, accounting for discrepancies, making inferences, assessing the generalisability to other phenomena.

In the English curriculum the key elements may be analysing arguments and generating insight into particular meanings, interpretations, attitudes and values, practice in the development of cohesive, logical reasoning patterns and the assumptions and biases underlying particular positions taken, achievement of a credible, concise and convincing style of presentation of arguments to others. These are also relevant to philosophy, debating, history, and science.

> "... Encourage problem-finding."

In the social sciences consider how to go about choosing an appropriate option among several possible ones, assembling the information required in the relevant area, identifying the major relevant and/or contributing factors, comparing advantages and disadvantages of alternative approaches and/or decisions, determining what additional information is required, judging the implications of different responses. These may be particularly useful in languages, and in the design of projects, as well.

The development or invention of novel objects, products, percepts or concepts and ideas (aesthetic, constructive, practical) and the encouragement of intuition, brain-storming and reflection, will enhance critical thinking in all subject areas, as well as being particularly meaningful in literature, writing, art, music, dance, etc.

6. Things the teacher can do which facilitate critical thinking

Teachers establish the educational climate and arrange learning experiences. They have almost complete control over the processes that take place in the classroom.

What is being said in the classroom and *how* it is being said, and what teachers *do* – greatly affects how students think. Some things that teachers do, have a strong and direct influence not only on educational achievement, but also on self-concept, social relationships and thinking styles in and beyond school.

1. *Question*, to help students attach what they know to goals or issues. This transforms the knowledge into meaningful relationships, which can then be applied to a variety of different, including novel, situations. Input can engender output, through questioning.
2. *Respond*, to make students aware of their ability to think critically and creatively, to help them extend their power of thinking and, above all, maintain their interest in continuing to acquire more effective ways of learning and thinking;

3. *Structure the classroom,* flexibly, to allow for individual, small group and total class interaction, as may be required. Managing the resources of time, space, materials, energy, interest and motivation to facilitate participation by all students. Make *thinking for oneself, and taking charge of one's own learning* the important and acceptable educational objective for the students.

4. *Model* types of thinking. As part of the day-to-day activities in the classroom, *think aloud* and speak about and demonstrate the strategies *you* use as you go about tasks, and encourage class discussion of the strategies and thinking styles different people are finding effective or not effective.

Questions and responses which enhance students' critical thinking

Aspects of questioning which have been found to initiate critical thinking include: the type and difficulty levels of questions asked; teacher wait-time (the pause between the end of a question and the response, or between a student's response and teacher feedback); the type of follow-up teachers provide to students' questions and answers.

Classroom interactions can be *recitation* or *discussion.* Recitation is totally teacher-centred with recurring sequences of teacher questions and student answers. The students just *recite* (in response to the teacher's questioning) what they have learned previously or what they are currently learning. Discussion involves group interaction. Students share what they know as well as what they do not know or understand; more than one point of view is put forth and considered; the teacher acts as facilitator by creating a non-threatening atmosphere of equality clarifying and guiding and unobtrusively moving the discussion in desired directions. Apt use of class discussion is an important tool to facilitate critical thinking.

We all know that the way we respond to and interact in class determines how much trust, warmth, openness, rapport and psychological safety the students experience. Our attitude also influences how prepared the students are to take risks in making contributions to a discussion, in problem solving and in their thinking. *Criticism* (and other ways in which students are *put down*) ends interaction. Curiously, so also does *praise.* But other responses open or extend the interaction process: *silence, acceptance, clarification* and *facilitation* all help.

In a study of 1016 classrooms in a variety of communities throughout the USA, John Goodlad reported that only 4 to 8 percent of class time was spent in the sort of *discussion* we have been describing. An average of 75 percent of class time was spent on direct instruction, and 70 percent of this time involved verbal interactions between students and teachers, with teachers *out-talking* students by a ratio of 3.1. Less than 1 percent of this *teacher talk* required students to do anything more than merely recall information. This is startling : we allow **less than 1 percent of class time for students to think for themselves!**

Implications of certain teacher responses

There is abundant research evidence showing that *criticism* hinders cognitive and affective (emotional) learning, and that it lowers students' self-esteem and achievement. So negative words, such as *poor* or *wrong,* can end both the interaction *and* the thinking process of the student. More subtle and less negative signals are: *you are almost getting it right, can anyone improve on this answer* or *you are getting close.* Ridicule, sarcasm and other responses which are designed to put the student down should be avoided at all cost. Making students feel they are failures certainly does not enhance thinking skills.

Useful are responses that extend and open discussion. Prominent amongst these are appropriate (but not too frequent) use of praise, large amounts of acceptance, clarification, facilitation, and the skilled use of silence.

Praise can be seen in positive value judgements such as *good, excellent, very useful, great,* etc. However, it is not the exact opposite of criticism. Praise reinforces any behaviour we want to encourage, and builds self-esteem. But there are some problems with indiscriminate praise. Praise builds conformity, but at times our goal is diversity. The effect of praise on some students is to make them dependent on others for their feelings of self-worth rather than on themselves. Also, praise, like criticism, tends to terminate the interaction between student and teacher. It is important for teachers to recognise this, and use praise judiciously. For example, it is especially helpful with reluctant and unmotivated students, young children, and in rote learning of low level cognitive tasks.

> "...Critical thinking is reasonable, reflective...focused on deciding what to believe or do."

The teacher's long term goal should be to cut down actions that close down interaction, and this includes both praise and criticism. Teachers can replace too frequent praise with acceptance of a variety of views, clarification, facilitation, and last but not least, silence.

Acceptance is non-judgemental and non-evaluative. Yet neither words nor gesture, posture, etc., give clues as to whether the child's response or idea was *correct, good, bad, worse, or better.* Acknowledge the answer, paraphrase or summarise it, apply it, or compare it with another idea.

Acceptance can build a psychologically safe classroom climate, in which students can take risks, feel that they are entrusted with the responsibility of making decisions and can explore the consequences of their own actions. An atmosphere of acceptance encourages students to examine and compare their own views, feelings, reactions, values and criteria of success with those of other students as well as with those of the teacher. Even when students' views, feelings, or criteria for action differ from those of the teacher in a seemingly unacceptable way, the teacher can still accept them temporarily, because he or she realises that only the student is able to modify them. The task of the teacher is then to provide information and to guide the discussion in such a way that it facilitates the processes which lead to students modifying their views, feelings, and criteria for action, making them more consistent with reality, morality, or the demands of the task and situation.

The classroom where critical thinking is fostered, is one where a spirit of inquiry prevails. Student questions and intellectual challenges are valued. The teacher admits uncertainty:

We are not really sure how evolution comes about.

I am not sure about my interpretation of this poem.

I continue to find new things about the Vietnam War.

In this way the teacher emphasises education as an exploration of the unknown, as well as teaching what is known. It is important that the teacher *repeatedly* conveys his or her own belief in the value of critical thinking

Encourage *problem finding.* Do not look for just quick answers and solutions. Teach and encourage children to identify problems, to wonder and to speculate. For example, the unthinking person may just smile or frown at graffiti. The thinking person wonders why in Europe graffiti is so often political, in the USA it is more commonly scatological, and in Australia it is usually childish. Nurture a *problem-finding* disposition by encouraging students to ask questions of their own, not just to answer the questions posed by others.

> *Here are some data about income distribution in Australia, what questions could we ask?*
>
> *We'll be looking at the role of the nuclear family in Aboriginal communities, what questions would you like to have answered?*

Acceptance can be demonstrated in different ways. It can be quite passive, active or even empathic.

With *passive acceptance* the teacher merely receives and acknowledges what the student says, without making any value judgement. It shows the student that his or her response has been heard: *That is one possibility; I understand; Could be; Hmm;* or non-verbal nodding of the head or writing the student's statement on the blackboard.

With *active acceptance* the teacher shows he or she has understood the student's response. The teacher reflects (not merely repeating), extends, builds on, compares or gives an example based on the student's response, striving to maintain the intent and accurate meaning of the student's idea.

With *empathic acceptance* the teacher absorbs feelings as well as understanding. The teacher not only hears and understands the student's ideas but is also sensitive to the emotions underlying or accompanying these. Empathic acceptance does not mean that the teacher need condone aggressive or destructive acts, rather, it demonstrates an understanding and acceptance of the *emotions* that produce such behaviour.

Questions of *clarification* convey that the teacher is seeking understanding but requires more information. Nearly 30 years ago, Flanders showed that achievement is higher in classes where teachers use, build on, extend or clarify students' responses. When teachers encourage students to elaborate on their answers and use other methods of clarification, students increase the consistency of their thinking, they become more task oriented, and purposeful in their problem-solving and learning.

Clarification contributes directly to the development of metacognitive skills. People who have a high degree of metacognitive awareness also perform at a high level on complex problem-solving tasks. Students become better problem-solvers and learners if they become aware of, and talk about, the strategies and steps they use in their problem-solving and learning. (See Item 14 in this ***set***).

Some students follow instructions and perform tasks without questioning themselves why they are doing what they are doing. They rarely, if ever, evaluate their own learning strategies or the efficiency of their own performance. They have virtually no idea what they are doing when they perform a task, and are thus unable to explain the strategies and steps they used in problem-solving. So when the teacher asks students to explain their answers, to show how they arrived at them, or to share their rationale, the teacher causes the student to use metacognition. **Thinking and talking about thinking begets more thinking.** This is the conclusion of 40 years of research evidence. Getting students to talk about their thinking and learning processes, during and after performance, enhances their ability to think.

All teachers aim to *facilitate* the acquisition of information, knowledge and skills. It involves being sensitive to students' needs, providing information and making it possible for students to do the acquiring themselves – and no one else can! For this purpose the teacher creates an environment and climate that is responsive to the students' needs. Such an environment is facilitated by: responding to every student's direct request for information; providing information (feedback) about performance; providing personal information (self-exposure) with which the student may identify or which he or she may use as a model; surveying the group about their reactions or for input of information; making it possible for students to find information for themselves, through experimentation with equipment or materials, by questioning others, consulting reference books, and dictionaries, etc.

Knowledge of results, i.e. *feedback*, is the most important factor in acquiring skills. It is also the most important factor in the development of good learning dispositions and effective habits of thinking. Rewards are not feedback: rewards can give information about competence, but can also be used to control behaviour. If students perceive the teacher's praise as controlling, their intrinsic motivation is likely to decrease. If, however, students perceive rewards as providing feedback about their skill or competence, intrinsic motivation will increase.

Silence and waiting time are important. Many classrooms could do with a more deliberate pace rather than encouraging impulsiveness. The teacher asks a question, expects an immediate answer and calls on the first student who puts up his or her hand. Such rapid-fire recitations can be useful, helping the teacher assess the single student's knowledge, assisting practice of facts such as tables and keeping students attentive. However, if the aim is to develop thinking, this style of interaction is counterproductive. Students need time to deliberate, to reflect about alternative possibilities, to weigh the evidence and to come to tentative conclusions. One useful way to reinforce such deliberation is to wait until all students have raised their hands before calling on anyone, then call on three or four and have the class discuss the differences in their answers.

Research has looked at waiting time, studying classrooms where teachers waited after asking questions or after a student responded. Teachers who wait just a short time, that is, for just one or two seconds, tend to receive from their students short, often one-word, responses. Teachers who wait for longer periods get responses based on more complete thought, and in whole sentences. Also, the responses use descriptive and modifying words more frequently and this is a sign of *increased* creativity and speculation in students' thinking. More interactions among students in the group occur, the number of questions students ask *increases* and most important of all reticent, shy and slower-thinking students begin to contribute.

"...Working co-operatively promotes critical thinking."

Teachers can communicate their expectations to students through the use of silence. Teachers who ask questions and then wait before they invite someone to answer show that they have faith in the person's ability to answer, given sufficient time. Teachers who ask a question, wait only a short time, and then give the answer or a hint, or call on another student, only demonstrate their belief that the child is really unable to answer the question or to reason independently.

Obviously, examinations should also allow for reflection and discourage guessing. Some students refuse to learn to think (despite strong encouragement) unless they are convinced that thinking will improve their marks. It is inconsistent to encourage thinking in the classroom and to discourage it in tests.

Structuring the classroom

Structuring the classroom for high-level thinking should be conscious, deliberate and clearly based on objectives. Having planned in advance the learning tasks and the types of interactions, state ground rules, describe and explain objectives, place limits and constraints, and create an organisational pattern. Things to watch are: the clarity of verbal and written instruction, contents, etc.; the effective management of time; effective organisation and the arranging of interaction; your own actions and reactions. Also consider presenting models and case studies of critical thinkers.

Allowing students to work co-operatively promotes the use of higher reasoning strategies and more critical thinking. Research on this topic says that competitive and individualistic learning strategies are much less effective. Teachers who encourage and promote critical thinking tend to provide a classroom climate where students: are able to see themselves as being in a decision-making role; decide on the strategies they will use to accomplish given tasks; determine the adequacy of an answer based on data they themselves are producing and are able to validate; are involved in the setting of their own goals (and the means of assessing the accomplishments of these goals).

The reward system in such classes is the motivation to learn, intellectual curiosity, a striving for competency and accuracy, a sense of responsibility to be a productive member of a community of learners, and a desire to emulate significant respected other people.

Models

How do students know what to emulate? Teachers are the major models and a great deal can be learned by studying good thinkers at work. Does thinking differ in different contexts and for different tasks? Is good thinking limited to a given age group, to certain professions, to particular ethnic groups, special classes, or to scientific and other scholarly effort? Are the best thinkers always right? The path to truth is often uncertain and full of torture.

Implications

Critical thinking enhances learning and thinking strategies, enriches the teacher's own conceptions and behaviour, improves instructional methods and broadens educational goals and outcomes. The school can tune the learning environment to encourage it.

Here is some food for critical thinking. Education, as experienced by students today, resulted from three revolutions:

1. everyone learned to read;
2. the printing press;
3. the transfer of instruction from home to school.

There is no question about the tremendous gains derived from all of these. But some things were lost when school became the centre of learning. Mass education today is characterised by passive learning and by very limited opportunities for the development of critical thinking. The fourth revolution will occur when we adequately accommodate individual differences, when learning becomes interactive, and when everyone expects critical thinking to be an essential component of debate and decision-making, in school, and in society.

Notes

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The quotation, defining critical thinking globally, is from

Ennis, R.H. (1988) A taxonomy of thinking dispositions and abilities. In Baron, B. and Sternberg, R.J. (Eds.) *Teaching Thinking Skills: Theory and Practice*. New York: W.H. Freeman & Co.

Lists of essential thinking skills have also been attempted by:

Lipman, M. (1991). *Thinking in Education*. Cambridge: Cambridge University Press.

Nickerson, R.S. (1988). On improving thinking through instruction. *Review of Research in Education*, 15, 3-57.

and also in the work of David Perkins and his collaborators, for example:

Perkins, D.N., Jay, E. & Tishman, S. (1993a) Beyond abilities: A dispositional theory of thinking. *Merrill Palmer Quarterly*, 39(1), 1-21.

Perkins, D.N., Jay, E. & Tishman, S. (1993b). New conceptions of thinking. *Educational Psychologist*, 28(1).

Perkins, D.N. & Salomon, G. (1989). Are cognitive skills context bound? *Educational Researcher*, 18, 16-25.

The distinction between *recitation* and *discussion* is from

Dillon, J.T. (1984) *The Character of Inquiry in Curriculum*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, 1984.

John Goodlad's study of 1016 classrooms can be found detailed in

Goodlad, J.I. (1983) *A Place Called School*. New York: McGraw Hill.

Examples of the abundant research evidence that criticism hinders learning and affective development, and the importance of wait time and silence can be found in:

Chipman, S.F., Sega, J.W. & Glaser, R. (Eds.) (1985). *Thinking and Learning Skills*. Hillsdale, N.J.: Lawrence Erlbaum Associates, 2 Vols.

Marton, F., Hounsell, D. & Entwistle, N. (1984). *The Experience of Learning*. Edinburgh: Scottish Academic Press.

Marzano, R. et al. (1988). *Dimensions of Thinking Instruction*. Alexandria, VA: Association for Supervision and Curriculum Development.

The work of Flanders, 30 years ago, showing that achievement is higher where teachers build on the children's responses, can be found in:

Flanders, N. (1960). Teacher effectiveness. In Ebel, R. (Ed.), *Encyclopedia of Educational Research*. 4th ed. New York: Macmillan.

Research evidence that thinking about thinking (metacognition) improves the quality of thinking has been building up for 40 years. Examples of this work can be found in:

Brown, A.L. (1978). Knowing when, where and how to remember: A problem of metacognition. In Glaser, R., *Advances in Instructional Psychology*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Flavell, J.H. (1982). Speculations about the nature and development of metacognition. In Weinert, F.E. & Kluwe, R.H. (Eds.), *Learning by Thinking*. Frankfurt: Kuhlhammer.

Forrest-Pressley, D.L., McKinnon, G.E. & Waller, T.G. (Eds.) (1985). *Metacognition, Cognition and Human Performance*. Orlando: Academic Press. 2 Vols.

Rowe, H.A.H. (1988). Metacognitive skills: Promises and problems. *Australian Journal of Reading*, 11(4), 227-237.

That allowing students to work co-operatively promotes the use of higher reasoning strategies and that a competitive atmosphere is less effective, has been by thoroughly researched and is discussed in the following books:

Chung, J. (1991). Collaborative learning strategies: The design of instructional environments for the emerging new school. *Educational Technology*, 21, 15-22.

Johnson, D.W. & Johnson, R.T. (1989). *Cooperation and Competition: Theory and research*. Edina, MN: Interaction Book Company.

Salvin, R.E. (1985). *Learning to Cooperate, Learning to Learn*. New York: Plenum Press.

Excellent books for further study of critical thinking are:

Dewey, J. (1938). *Experience and Education*. New York: Collier Books.

Resnick, L.B. (1987). *Education and Learning to Think*. Washington, DC: National Academy Press.

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Women's Franchise: A Play

from
Women's Franchise:
A Short Sketch
by
"Eve Adams"
1893

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The author of *Women's Franchise: A Short Sketch* is unknown. Sheila Ahern and Beryl Hughes, who adapted it, grant all schools or other groups who wish to use the play, permission to do so.

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Discovering a Nineteenth Century Story, *Women's Franchise: A Short Sketch.*

Kathleen Coleridge, the special materials librarian in Victoria University of Wellington, arranged a display in the Library in connection with the conference, Suffrage and Beyond, held at Victoria in late August 1993. While looking at the pages of the books in the glass cases, I noticed a pamphlet entitled *Women's Franchise. A Short Sketch* by Eve Adams, whose name was given in inverted commas. I read the first page, all that was visible. I saw the possibility of doing something with this interesting contemporary material. Kathleen Coleridge was kind enough to arrange for the pamphlet to be removed and photo-copied for me.

I hoped to arrange a play-reading based on the pamphlet, if it lived up to the promise of its first page. Fortunately, it did. Six of us who were attending the conference dressed up in what we hoped looked like clothes of the 1890s and read the parts. Since then a group of women attending another conference, one on women and communications, who had heard of our venture put on a similar reading. In the hope that teachers of Social Science, History or Women's Studies may want to follow suit, I have arranged *Women's Franchise* in the form of our little play.

First a word about its provenance. It was published in 1893 by an author whose identity is not known. The printers were Lyon and Blair, a firm very well known in Wellington at the time. This probably indicates that the author lived in or near the capital. There is nothing definite in the story to indicate its setting but a reference to 'the numerous departments of the Government Buildings' perhaps confirms a link with the capital. The pamphlet is held in the pamphlet collection of Sir Robert Stout but the Stout catalogue contains nothing about the pamphlet except its date.

The story presents an afternoon tea party at which six middle-class women, aged from 18 to 23, talk about women's suffrage, which they link to other issues: free education, the Bible in schools, equal pay, class and temperance. The author does not tell us much about the women, although one or two are described in women's magazine clichés. May Annesley 'turned her fair face, glowing with health and happiness towards her hostess!' Beatrice Western 'turned a lovely pair of grey eyes on the late arrival....' There is not much attempt at characterisation, except that Rhoda Martin, the only one who is given as having an occupation, comes over as more opinionated and forthright than the others: she has a 'straightforward brusque style' and speaks in a clear, energetic voice.

The sketch consists chiefly of a discussion between the women. Dr Sheila Ahern and I, who prepared it for the play-reading, simply eliminated the author's comments, some of which I have now preserved as stage directions. A couple of phrases have been changed to make the work more intelligible and the final lines have been added as a suitable conclusion for the play. Two speeches which the printers seem to have mistakenly put together have been separated and minor changes have been made to the punctuation. I have also cut down the author's frequent use of emphasis.

It is very likely that other people using the sketch might want to make a few cuts.

Beryl Hughes
1993

Women's Franchise - The Play.

Scene:

The drawing-room of the Western family. The family, like all the characters, are middle-class. Tea is being served and handed out. All the women but May are in the room.

Characters:

May Annesley
Beatrice Western
Madeleine Joyce
Rhoda Martin
Eva Western
Marion Somerton

Enter May.

May (*in an excited tone*): Have you registered, Bee?

Beatrice (*handing May a cup of tea*): Registered what, May?

May (*impatiently*): Why, your vote, of course; tomorrow by four o'clock will be too late!

Beatrice (*with a slight contemptuous smile*): My vote! No indeed, May, I do not approve of anything so very unlady-like.

Madeleine (*quickly*): Unlady-like? What nonsense you're talking, Bee.

May (*merrily*): We are not ladies, we are all women now!

Rhoda (*with a comical look and gesture*): And supposed to have a thinking head on our shoulders; I feel the responsibility weighing heavily on mine already!

(*Laughter*)

Eva (*sighing*): I wish I could vote, but I am only eighteen!

Beatrice (*laughing*): You little goose, be thankful that you are still a baby, fancy you voting; why you would only think of taking the tax off toys.

Eva: Now Bee, don't be so sarcastic!

May (*looking critically at Beatrice*): Well, Bee, honestly speaking, what is your objection to the Women's Franchise?

Beatrice: Well, to tell the truth, May, I don't relish the idea of being hustled and pushed about at the polling-booths, and being jibed and jostled by a crowd of rough men, smoking filthy tobacco, and using still more objectionable language; I really think ladies have no business in such places. Now, seriously, girls, do you consider it right?

May: Suppose we all give our opinions upon the evils and advantages to be gained by the softer sex, by this wonderful power that has been granted to us as women. Rhoda, please expound your views on the subject first, but let us only use the word *woman*, we will leave the term *ladies*, which to me is an odious one, for our washer-ladies to indulge in. Does my suggestion meet with general approval?

Chorus: Yes.

May: Now then Rhoda, fire away.

Rhoda: The greatest advantage to be derived from the Women's Franchise that I can foresee will be the privilege of getting good, steady men into the House. Up to the present the men have had all the power of electing the members, and see what a dreadfully 'scrubby lot' we have been obliged to put up with for the past few years.

Beatrice: But Rhoda, how do you imagine the votes of the women will in any way influence the character of the Members of the House of Representatives?

Rhoda: In this way, Beatrice: women are more independent nowadays; they think and act for themselves; and if they find out a man - be he high or low, rich or poor - is not straight in his conduct, nor as well-principled, or steady as he should be, not *all* the lectures in the world will make her vote contrary to her fixed ideas of right.

Beatrice: (*laughing*): In short, when the women make up their minds to put a certain man into Parliament it will be a case of 'scissors' with them. With all due deference to your better judgement, Rhoda, I still think it will make them very unwomanly.

May: Bee, for goodness sake don't harp so continually on 'unwomanly.' Do you imagine it is more 'unwomanly' to go in a quiet, respectable way and record your vote, and generally help by your good sense and and influence to introduce a purer element into the House, or to go on quietly as we are at present, calmly allowing the men to do everything for us? If man were really the superior creature, and Lord of Creation that our grandmothers are always talking about, I, for one, would never stand against them. But do you girls candidly think that in the present day they are our superiors?

Chorus: No, indeed, they are not!

Rhoda: I say they are considerably my inferiors!

Eva: Oh, Rhoda, you are conceited.

Rhoda: No, Eva, I am not. Look at how very unjustly I am treated, for instance. I work the typewriter from nine a.m. to five p.m. I go steadily at it - with the exception of an hour for lunch, I do not waste one moment of my employer's time; not a single shilling do I spend for beer or tobacco, so the room is free of those delightful odours. My master has told me more than once that my work is better done and more correct, and yet he pays me £40 a year, while my predecessor - a *man* - used to get £150. Is that justice?

Madeleine: Well, dear, is it not reversing the order of things a great deal if all the young women are to be typewriter operators, telephonists, post office clerks and so on. What are the men to do for a living? And after all said and done they are the real breadwinners.

Rhoda: Granted, Madeleine, but for the same amount of work the same wages should be paid, be it man or woman.

May: I quite agree with both of you, but whose fault is it that women are obliged to do this work? If the men were contented to live quietly with their families, and take their earnings home, things might be different. But just reflect how many spend pounds in the publichouse - I beg your pardon, Bee, hotels - shouting drinks not only for friends but strangers as well. The consequence is, money is short at home. Perhaps the family consists of four girls and a son, the latter is at once drafted into one of the numerous departments of the Government Buildings at a salary of £40 or £50 per annum, rising gradually, I believe at the rate of £10 a year, which is only sufficient to keep the young man himself. Then the girls must be as accomplished and well-dressed as their neighbours, and as that cannot be managed on papa's salary, they must turn out and work, and though the half are not fitted for more than a general servant's place, they are (through this over-grown system of free education) too proud to seek a situation in their own sphere, and, to be genteel, must aspire to be teachers or clerks.

Madeleine: Or worse still, lady helps!

Marion: Oh, defend me from ever becoming a lady help!

Beatrice: I would far rather be a general servant at once, and indeed a great number who go out as lady helps are in reality not as refined or as well-mannered as a respectable servant! But I do wonder why the working classes are too proud to be servants, for one can tell at a glance what their position ought to be when one sees them in the telephone exchange, or typewriting or teachers: and however well-dressed they may be, one can always tell the *genuine* article at *once*!

May: Now, there is Mrs Marsden, Mother thinks very highly of her; by birth and education she is far superior to the people she lives with as cook. When Mother asked her why she took that situation, she answered very sensibly that she had to earn her living, and as she was not clever at teaching, and had always been fond of making dainty dishes, she much preferred cooking to being a lady help, for she said she had a maid to do the dirty work, and when the dinner was served at seven o'clock she knew her work was over for the day, and she gets three times the amount of wages that a poor lady help receives. But let us return to our franchise business.

Beatrice: Harry Bennett was saying last evening that the first use the women will put their vote to will be to close all hotels and stop the drink traffic entirely. I quite expect the temperance people will do their best to attain that object.

May (*thoughtfully*): There is no doubt that drink is the curse of this country, but at the same time I do not see why, because some people make beasts of themselves by drinking to excess, others who need the stimulant, and take everything in moderation, should be debarred from indulging their tastes.

Madeleine (*half-joking*): I am sorry to find you are not a blue-ribboner, May! as you possess the gift of the gab to such an extent. See how useful you would be on the temperance platform.

May: No, no, Maddy, I do not aspire to be a public woman, but I hope I shall use the influence I may have in a quiet, sensible way.

Eva: Well, I know that I should burn all the hotels and throw all the publicans into the sea.

Marion (*playfully*): Oh you bloodthirsty little wretch! It is a good thing for the men that you have no vote.

Beatrice: Well, Mother says if she voted at all, it would only be in favour of the Temperance candidate; she says the laws to be properly made and carried out should be administered by a sober intelligent class of men. (*With a smile*): But then you see Papa will not allow Mama or me register our vote.

May: Then, Bee, I hope a law will soon be passed when a man will be fined for coercing his wife or daughters; I do think it is such a pity that your names are not on the roll.

Marion: (*gaily*) I believe Beatrice your real objection to registering is that everyone will know that you are twenty-one!

Rhoda: Well, the Temperance people won't get my vote, nor will the candidate who wants Bible read in school.

Madeleine: Oh Rhoda, what a heathen you are! Both my father and mother say that one of the evils in New Zealand is the fact of the Bible being abolished in State schools. How can the country get on without God's blessing is what they say.

Rhoda (*hastily*): Don't mistake me, girls, I am no heathen, but the Bible to produce any good lasting effect should be read reverently, and explained most carefully, now this you know could not be done. I do not blame the teachers, there is so little time for *them* to attend to religious instruction; then every denomination would require to have their children taught in *their* own way, so that unless they got teachers to attend to the various rules and dogmas of their own particular religion, I fancy it would create great confusion, and is best left to the Sunday schools, or better still the parents could impart that portion of the education. [*Pause*] Besides, you all know the real business of the day is to cram or beat into the opening brain, as much knowledge, particularly figures, as can possibly be managed. It is one continual drive, drive from the time one enters the school at nine a.m., till one leaves at three, four, or five in the afternoon.

May: And if it were such a crime as the Temperance people say to imbibe strong drink, do you suppose for one moment our blessed Saviou would have performed the miracle at Cana of turning the water into wine?

Understand me, I am not advocating drinking to excess, but everything in moderation is given us for a blessing.

Rhoda: Thank you for reminding me of the miracle, May, one is so apt to forget the Saviour's example in the everyday work.

Beatrice: Well, if you quote the Bible, does not Paul say: Wives submit yourselves to your own husbands. He even remarks that women should not go uncovered in public places. Now don't you think the Franchise is carrying things a little too far in making women equal with the men?

Rhoda: Certainly there is a great deal to be said for and against but men will have to rise like the Phoenix from the ashes, a superior and holier being than we have been accustomed to for years, before woman will bow down and worship him as of old.

May: We had a few friends in one evening last week and this *pernicious school system of ours* as one gentleman described the Government schools, was very exhaustively discussed; I wish you had been there, Rhoda, you would have been as deeply interested in the conversation as I was. One made the same remarks that you have about Bible reading in public schools; she said the master or mistress as the case may be, would read through the chapter as a mere form, without a word of explanation or real thought of the divine truths they had hurried through, it was something that had to be got over before the real and more important work of the day began; she hoped that Parliament would not make religious instruction law. Both Mr. and Mrs. Marston quite agreed with her, they, you know, were head master and mistress of a school in a large town in the Middle Island, and Mr. Marston contended that there was a great deal of useless expenditure in making the standards so high. [*Pause*] *Free* education, he thought, ought not to go beyond the fifth standard, and so far the education should only consist of real useful knowledge, such as the three R's, with the addition of history, geography, and a little grammar. That would be quite sufficient knowledge for any intelligent boy or girl to carry them through life successfully, should they belong to the working class, and, if other classes required more, such as Botany, Chemistry or any 'ologies', let them pay for it; and by doing so a great deal of unnecessary taxation would be saved the Colony, and a class of men and women who had to pay for a thorough good education would be enabled to earn a competent living.

Beatrice: Yes, that is certainly true. You two girls have certainly placed the whole matter of education and Women's Franchise in a very different light, for which I shall always be grateful! (*Bows and smiles to Rhoda and May.*)

May: Then again, Mrs. St. Hellier, who is great on Women's Suffrage, Temperance, and certain other things, made a very good suggestion: that if the education in the state schools stopped at the fifth standard, Government would then be enabled to create a fund for further educating any boy or girl from whatever class (whose parents or guardians were quite unable to do so), if the said child or children showed a decided genius and a wish to rise in general knowledge and to be taken through all the branches of study. The schools would then turn out really clever men and women, instead of, as at the present, giving the mass a smattering of everything, which does no good to themselves or anyone else.

Eva: Well Papa says, by the women getting the franchise, they will lose a great deal of their influence in the home circle, and that the respect shown to them as the softer, gentler sex, will in time entirely vanish, and they will be made to feel their new position very keenly.

May: Well, I can't see how that can possibly be. The wife, if she loves and respects her husband, will, in a great many instances, be guided by his superior judgement, and they will, in a great many cases, be drawn more together if they discuss the affairs of the country; not as it now is, the man going to the polling booth, giving his vote, retiring to the publichouse and drinking, spending more money in one night than the wife will do all the week!

Rhoda: Up to the present, men have made all the laws, and see how very unjust they have been to women. It is only within the last ten or fifteen years that the Women's Property Act has come into force. Before that, though the money may have been the wife's before ever she saw her husband, yet when once married, unless he kindly settled it on her, he could obtain full possession of her property, money or otherwise, and even will it away from her if he chose to do so. Was that not an iniquitous law, made solely for the benefit of the sterner sex? I can remember what a fuss there was when it became law that women could retain possession of their own. And for all that we do not hear that they leave their husbands out of their wills, or defy them and leave home oftener than of yore, though that is what was predicted most solemnly.

Marion: Giving the women their own reminds me of the Queen most graciously granting pardon to an *innocent* man. I think that is such a cruel farce and quite on a par with the other.

Rhoda: Well, as we are discussing politics, don't you girls think it is very hard on the publicans to close their hotels summarily without granting compensation?

Beatrice: Compensation? Indeed, Rhoda, I think it would be most unfair to give it ; why, we shall all be so heavily taxed that every girl will have to turn out and work, and I am sure that I am not so philanthropic that I should like to work, especially for such an object.

Rhoda (*smiling*): But Beatrice dear, there are as good Christians and honest people as you will meet though they do keep hotels and I repeat it is very hard and cruel to close the hotels without granting some compensation. A case was put very plainly before me last week. A highly educated individual - were he not in an hotel we should pronounce him a thorough gentleman - paid £900 cash for the goodwill of the place besides that the rent is £8 or £9 per week. He has been in possession some six or seven years, and has never had the police in the house on account of any disturbance; no drunkenness or quarrelling have been allowed on the premises. He and his family have kept themselves respectably and honestly, and yet, if they close that house, the family will be turned into the street perfect beggars. Now, girls, would not that be hard? Would you call that justice?

May: No, no, indeed it is not.

Marion: I am not sure that I quite understand about this, but I will think it over carefully before we meet again.

Beatrice, Eva, Madeleine: Yes, I will, too.

Madeleine (*rising from chair*): I had no idea it was so late. It is half-past five and we dine at six. I have only just time to get home and dress for dinner. I am very sorry to disturb you all, but I really must go.

The others rise.

May (*kissing Beatrice*): Goodbye and thank you so much, Bee. We did not mean this to be a political meeting, but as it has turned out to be one on a small scale, I think we must put it in our minutes That the young women who met at Miss Western's afternoon tea wish to express their gratitude and cordial good will to Sir John Hall and Sir Robert Stout for having so persistently and triumphantly brought to a successful issue the Bill granting the women of New Zealand the privilege of having their names placed on the electoral roll of the colony.

Rhoda: I second that motion most heartily. I think a monument ought to be erected in commemoration of the event.

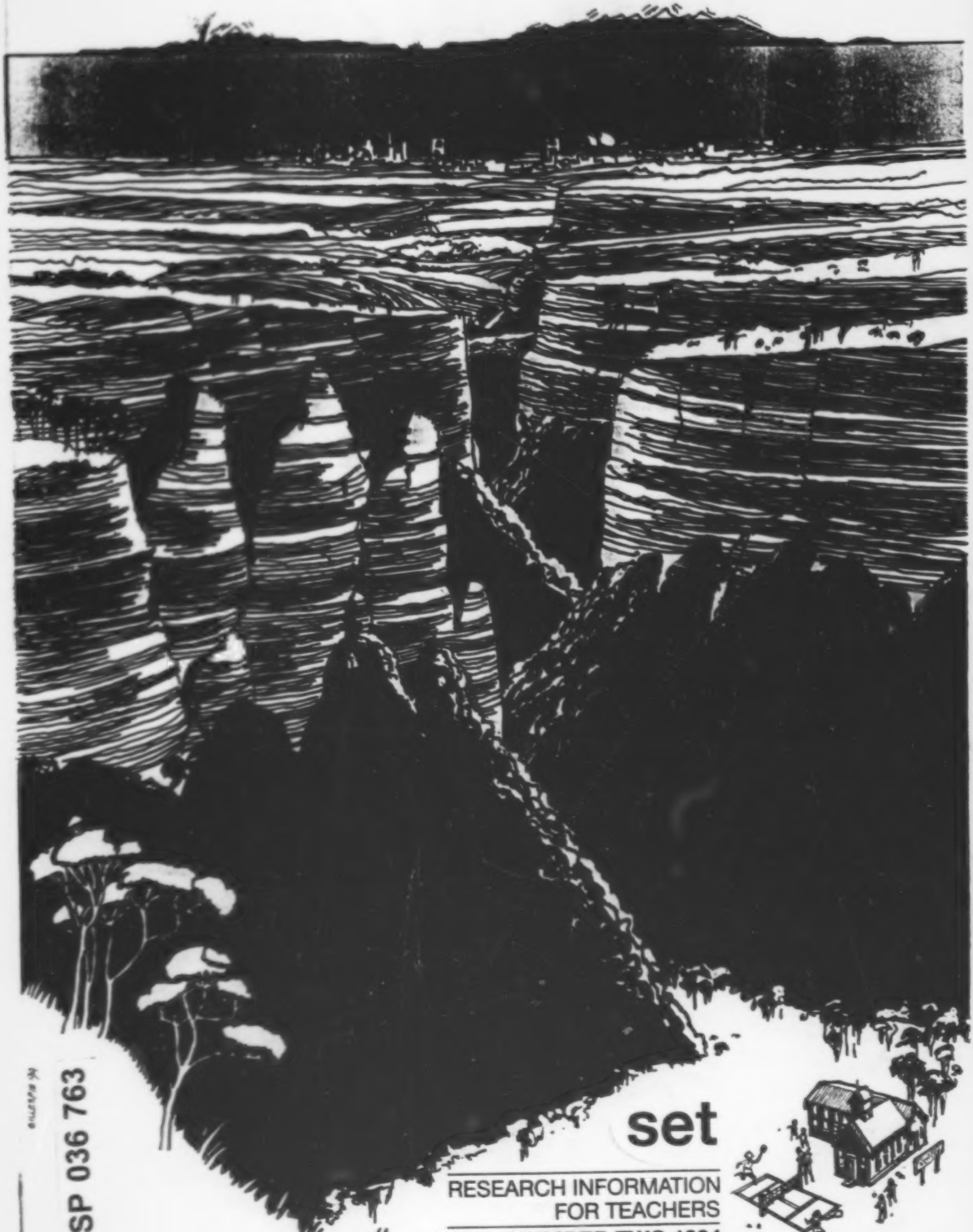
Eva: I would most willingly make a third to that but I am only eighteen and have no vote, which I consider too bad.

Madeleine: We must not leave out of our minutes all those papers which have fought so valiantly on our behalf, and to render our sincere thanks to them also.

Marion (*gaily*): Only think, girls, what angels we shall be considered for the next few weeks, at least until the elections are over; I for one shall hold my head very high.

Amid laughter, the women move towards the door.

May: Let's meet at my house, the first Saturday after the election. We can talk about our experience of casting our first vote. And Beatrice, I hope you will register and vote like the rest of us.



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item 1

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Research information for everyone interested in education: teachers, principals, students, lecturers, actively involved parents, board members...
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A review of the many research projects on how prior knowledge affects learning. Generally, having old knowledge to which new knowledge may be attached greatly assists learning the new. Complements item 3.

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School computers can now provide very versatile and exciting ways for children to present cross-subject 'projects'. The learning, and what the teachers learnt too, was researched.

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Lise Bird and Deborah Willis
At a typical secondary school the researchers discovered how successful the presentation of the science curriculum in discrete separately assessed units of work is. And discovered the (unhappy) effects of the in-school assessment for a national examination.

9. Task Design, Dialogue, and Learning
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The researchers had good reason to believe that teaching physics to young children would work best if children could rub their ideas against others. However, the ideas they are asked to investigate need to be in carefully designed work.

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Research discoveries by experts in teaching English as a second language can be transferred to the teaching of any second language. Practical examples and teaching programmes at different levels.

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Neil Pateman
In the 'salad bowl' of ethnic and cultural diversity of Hawai'i, there are attempts to make school work more relevant to all cultures, including involuntary minorities such as the indigenous Hawaiians. Teaching geometry in new ways is the focus of the research described here.

14. Reading to Pre-schoolers: Models of Tutoring
Stuart McNaughton
There has been a lot of propaganda in favour of reading to children. All cultural and socio-economic groups studied in this research read a great deal with their children, but with different styles, expecting different outcomes and reflecting their cultures.

15. *set* Index
All the items that have ever appeared in **set**, with subject and author indexes as well. This index is also available on computer disk for libraries and personal use: an order form comes with this item.

item 2

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Editorial

LLEWELYN (LLYN) RICHARDS played the clarinet at high school, but not too well. He was a teacher in New Zealand, London, Nigeria, and New Zealand again, then an editor for the School Publications Branch of the New Zealand Department of Education. He has been Editor of *set* since 1979, but bows out with this issue.

Research for Teachers

Researchers complain that teachers don't read research, and teachers complain that research is not worth reading. As editor of ***set*** I can't help saying they are both right! Teachers don't read educational research, but it isn't surprising when you see what the researchers are researching.

In Table 1 is some simple bean-counting.

Table 1

Types of Educational Research in Australia and New Zealand, 1987-1991

Source	Research into		
	Group 1. Philosophy, Assessment, History, etc.	Group 2. Topics which throw light on Policy	Group 3. Schools and Learning and Teaching
New Zealand Journal of Educational Studies			
Vol 23	7	6	2
24	8	2	3
25	4	5	1
26	6	2	5
27	4	2	2
Australian Journal of Education			
Vol 32	11	6	3
33	8	9	4
34	5	15	3
35	6	6	3
36	4	1	2
1987 Joint Conference of the Australian and New Zealand Associations for Research in Education			
NZ papers	25	29	22
Australian papers	37	40	35
1992 Joint Conference			
NZ papers	48	14	15
Aus papers	184	78	62
Totals	357	215	162
Totals %	48.64	29.29	22.07

A quick conclusion is that only a quarter of what 'educational' researchers are writing and speaking about is of direct interest to teachers. Of course, some research takes years to come to fruition and may involve a lot of people. So I had a look at the work NZCER is currently engaged in: See Table 2.

Table 2

Current NZCER Research Projects

May 1994	7	13	11
%	24	42	35

This suggests that maybe teaching and learning research is about one third of their effort. What are the other types of research?

Group 1, Philosophy, Assessment, History....

In this grouping I have included things that teachers are interested in, as human beings, citizens, scholars, and artists. This 'grab-bag' of research includes philosophic research (titles such as: *What is the nature of education?*); mathematical research (*Percentile rank shifts on the PATs*); historical research (*Church schools in the goldfields*); and also polemic (*Constructivism undermines moral truth*); and cries of despair (*New curricula are old strait-jackets patched*).

There are a lot of similar topics being covered every day in the newspapers, the TV, magazines, clubs, societies, and in conversations round home: peace between nations and between parents, economics and unemployment, crime and punishment, Mozart and Winton Marsarlis, food and health, development and conservation, politics and morals...

I wish I had had space in ***set*** for more of these topics. There is some fine historical writing from university educationalists, witty and full of insights, especially when old policies reappear in drag on the political stage. Then there are the philosophical concept-busting articles I enjoy because I love a nice knock-down argument ('There's glory for you!' said Humpty-dumpty). And the 'shock-horror' tales of fatuousness-become-policy, as politicians succumb to doctrinaire simplifications. Then there are the accounts by psychometricians of how they are refining assessment techniques another notch. But there are only so many hours in the day, so many pages in ***set***.

Group 2, Policy Research.

Policy research is mostly collecting data about current situations, massaging it, and presenting it to help the formation of policy.

Example 1. Clarinets (an invented example)
The government wants more children to learn a musical instrument — it was in their election manifesto. The educational bureaucracy immediately needs to know the effects of putting different policies into practice — it has been asked by the Minister to recommend one. How many parents want their children to learn the clarinet? Are there tutors available or will training courses need to be run? How do schools feel about it? Would it be best to put money into free clarinets, or more tutors, or correspondence courses? Will new music rooms need building? Should schools encourage withdrawal from other lessons or fund lessons after-school? Would synthesizers do instead...?

Extensive head counting, some costings, and a set of questionnaires will be needed, and some simple statistical analyses as it goes along.

Note that even an out-of-work clarinet tutor is not interested in this research **from a teaching point of view**. His or her job may be affected, his or her bargaining position, lifestyle, income, marriage, children, politics... But teaching not at all. Is it wiser to introduce dotted crotchets before triplets, or after, or together? Will alternative fingering interfere with expression though aiding rapidity? Will the embouchure look after itself? When should memorising (rather than sight-reading) be expected or encouraged? What can one do with the tone deaf pupil? With the lazy pupil? With the disruptive pupil? These are questions the clarinet teacher, **as teacher**, wants answers to.

It is also true that someone must do policy research. Education systems (Departments, Ministries, etc.) must do, or fund, policy research however, they cannot be expected to commission research which could be used against their political masters. Independent bodies, such as universities, must do the policy research no-one else will do.

Policy research is important for the nation's health. But it is not directly about learning and teaching. Those researchers who want to help teachers **teach** and children **learn** can, in particular, put away all questionnaires. On the whole, teachers are looking for research on learning and teaching and not for opinions.

Group 3, Teaching and Learning Research.

This can include studies of places (homes, classrooms, clubs, the media) where education takes place; learning theory and practice; teaching theory and practice.

Pure (or Basic) educational research

When we look at research that **is** of interest to teachers we find that a fair bit of it is coming from outside education. Not only that, a lot of it is pure research, not just the application of basic findings to children or classrooms. 'Pure' research is as vital to teaching as x-ray crystallography is to the construction of aircraft. Here are some examples.

Example 2. Research on social aids (and blocks) to learning
Piling up observations of, and statistics about, working-class pupils has proved very fruitful. Paul Willis (*Learning to Labour*) and Gaby Weiner (*Just a Bunch of Girls*) in the UK, Bob Connell (*Making the Difference*) in Australia, Alison Jones (*At School I've Got a Chance*) in New Zealand, have helped prove pretty convincingly that middle-class expectations 'capture' the school curriculum and so schools build on the 'cultural capital' the middle-class children have; the rest cannot take advantage of what schools offer. This ensures that middle-class children are 'successful' in the world and that working class and ethnic minorities get a raw deal.

Unfortunately, the only lesson for teachers seems to be that if all the poor were made rich (and middle class) some discipline and teaching problems would (probably) disappear. A lot of research doesn't get into ***set*** because it fails to offer any solution to problems except, 'make everyone rich.' Alison Jones manages to be helpful to teachers as well as exposing middle-class blinkers; Paul Wood reveals another helpful idea. See

Jones, Alison. 'What really happens in the classroom' in ***set*** No. 2, 1987, item 7.

and

Wood, Paul. 'Teaching our pupils: adapting teaching styles to cultural and class differences', ***set*** No. 2, 1992, item 9.

Example 3. Research on memory
Memory is a vital part of learning. How the mind remembers, the different types of memory it manages, the ways in which memory handling and memory capacity change as we grow.... All these are absolutely essential bits of knowledge for the teacher. When I was a teacher I had pretty elementary theories about memory, but I was using those theories every day, as I taught. Research into memory by medical researchers is getting exciting and useful results. See

Baddeley, Alan. 'Reading and working memory' in ***set*** No.2, 1979, item 4; and *Best of* ***set****: Reading*, 1985, item 10.

and

Morton, John. 'How young pupil's memories work' in ***set*** No.1, 1991, item 5.

Example 4. Research on motivation
Why do we do some things and not others? How do actual effects, such as getting a cross for your answer '14' to the sum '2 x 3 + 4 = ?', change your actions? How is it that rules, such as 'multiplication before addition', change our actions better than experiencing effects, (such as getting the sum wrong)? Which sort of motivation is more efficient? Lasting? Effective? This research, so important to teaching, is by psychologists. See

Catania, Charles; Matthews, Byron & Shimoff, Eliot, 'Rules, rules, rules' in ***set*** No. 2, 1992, item 5.

Example 5. Research on learning
What is the effect of telling someone the answer to a problem they are slow, or unable, to solve? This is an absolutely vital question for teachers but I have found no educational researchers on this trail — again it is the psychologists. And the answer seems to be: telling people the answer **inhibits** and may even **stop** their remembering it, or using it again. See

Dominowski, Roger and Buyer, Linda, 'Solving — not solving' in ***set*** No. 1, 1991, item 6.

Think what an effect putting that finding into practice in your average classroom would have.

Does learning in one field transfer across into other fields? What conditions encourage transfer? Can you teach anyone to make transfers or does it always come as a sudden flash as it did when Archimedes saw that what was happening to him in the bath would happen to, and test, a fake gold crown? Again vital questions for teachers, especially when the answer may mean changing your teaching practice. See

Ceci, Stephen, Rosenblum, Tina and de Bruyn, Eddy, 'A day at the stock market' in ***set*** No.2, 1994, item 11.

Mixed pure and applied educational research

There are some educationalists working on learning but mostly their research is restricted by the culture, time and place they are working in. For example, there is a fair bit of useful classroom research about.

The best work I know in this field is by Adrienne Alton-Lee and Graham Nuthall. If they have got it right, they have a pretty good handle on what is necessary for a bit of learning to go in and stay in. Their work has not been in a subject easy to monitor, like mathematics, but in the difficult subject, Social Studies. The chances are that they have got it right, and their findings apply not only to white middle-class children but to all of us.

Example 6. Research on learning
Adrienne Alton-Lee, and her team collected every scrap of class work by 5 typical children, matched this with every scrap of conversation the children had (caught with personal transmitters) and information on home background, etc. Tests were made before and after the lessons, then a year later. From this enormous mountain of data lots of unexpected insights emerged on the way.

such as proof positive of how the curriculum, as it is experienced by the children, encourages sexism. They also uncovered proof positive of how racism is expressed subtly and the damage it is doing.

But the main drive was towards a theory of what is needed for lasting learning to take place – the pre-requisites and the methods needed. A first article, back in 1983, was a cracker, and possibly the best article ever published in ***set***. See

Alton-Lee, Adrienne 'Organising for learning', ***set*** No.2, 1983, item 5.

For articles on the blocks to learning (and a fully human upbringing) which racism and sexism are, see

Alton-Lee, Adrienne; Nuthall, Graham & Patrick, John 'Take your brown hand off my book', ***set*** No. 1, 1987, item 8.

and

Alton-Lee, Adrienne; Densem, Prue & Nuthall, Graham 'I only think of the men...' ***set*** No.2, 1990, item 16.

For the latest on the learning research, see, in this issue

Nuthall, Graham & Alton-Lee, Adrienne 'How pupils learn', ***set*** No. 2, 1994, item 2.

Keep an eye open for a follow-up with more things to do in class. It will be very interesting to see the results when similar research is done in other subjects.

Example 7. Research on the capacity to learn

Are people born with limits to some of their mental abilities? We all recognise the gross differences, the maths whizz-kids, the intellectually handicapped Down's Syndrome children. But is IQ a real measure? It looks pretty useless outside school. See

Ceci, Stephen and Liker, Jeffrey 'A day at the races', ***set*** No.1, 1994, item 11.

Does it grow or decrease? See

Flynn, James (and Raven, John) 'IQ tests and cultural distance', ***set*** No. 2, 1990, item 3.

Can one inherit a difficulty with some intellectual activity, say, spelling? Geneticists are working on that one; see

Stevenson, Jim and De Fries, John 'Twin studies of spelling' ***set*** No. 2, 1991, item 2.

What about cognitive deficits, such as autism and dyslexia? Medical researchers are working on these; see

Frith, Uta 'Holes in the mind: cognitive development and cognitive deficit', ***set*** No.2, 1992, item 4.

Example 8. Research on how learning is dished up

The range is enormous: you can do no teaching at all and see what nature can manage; you can try one-to-one tutoring; or classes of 30; or TV programmes to millions. Then, in school systems, there is the grouping problem: are the students grouped into classes at all? Are classes chosen by family, tribal or language affiliation? By age? By sex? By wealth? By test results? By zodiac sign? Is there rigid promotion by age, or promotion by test results, or 'readiness', or promotion when there is space for another child in the next room? At least one researcher can be found in ***set***, slashing through this jungle; her work began with a demographic investigation, moved on to an analysis of the mathematics of assessment and then involved a study in anthropological-style. See

McDonald, Geraldine 'Learning to be intelligent', ***set*** No.2, 1993, item 2.

Different cultures organise for teaching in different ways and studying these differences is both rewarding and extremely helpful in all multicultural situations. See

Fillmore, Lily Wong 'Diverse society: diverse education?', ***set*** No. 1, 1990, item 5.

Close observation of real situations is tremendously revealing – research that is ecological in style. For example, the Alton-Lee/Nuthall research in Example 8, and

Pizzo, J. 'Breaking the sound barrier: classroom noise and learning style', ***set*** No.2, 1983, item 8.

and

Tizard, Barbara 'What Joyce learnt from her mother', ***set*** No.2, 1985, item 8.

Challenging the standard Western set-up for teaching (age-chunked classes of 30, desks in rows, silence, teacher instructing, competition for marks...) and examining class size, teaching by peers, co-operative learning, promotion policies, pupil-run programmes and 'peace' education, has produced some wonderful ***set*** items. See

Campbell, Jack and Robinson, Margaret 'Two dozen's a crowd', ***set*** No. 1, 1994, item 10.

and

Limbrick, Libby; McNaughton, Stuart & Cameron, Marie 'Peer power', ***set*** No.2, 1985, item 13.

and

Johnson, David and Johnson, Roger 'Co-operative learning strategies for mainstreaming/integration', ***set*** No.1, 1988, item 4.

and

McDonald, Geraldine 'Promotion, retention and acceleration', ***set*** No.2, 1988, item 3.

and

Cameron, Jan and Dupuis, Ann 'Dealing with conflict: mediation programmes in schools', ***set*** No.2, 1988, item 8.

and

Richards, Llewelyn 'Teaching peace', ***set*** (Australian edition only) No.2, 1984, item 4.

Applied research

There is plenty of research which, though tied to a time, a place, a classroom, a group of children, a particular school, or a single teacher, can be of great help. Some of these projects involve simple head-counting and observation and calculating a percentage or two. Many of the best are research projects by the teachers themselves; they gave spectacular results in the teacher's own classroom, and can be adapted by other teachers.

Example 9.

The pre-school thought that the book corner seemed under-used. Observations, note-book in hand, over a full session showed that the corner was used, but no-one stayed long. The reason turned out to be that the corner was sited near the passage to the loo, and the kids, and helpers, didn't find that nice. The corner was shifted; books were read again. See

Barney, David 'The pre-school environment: stand off and watch', ***set*** No.2, 1976, item 11; and in *The Early Childhood Folio, No.1*.

Example 10.

A teacher gave her new entrants an exercise book and ball-point on their first day at school and asked them to write. None of the children were put off by this approach. She kept a log of each child's writing and found that half of what she had been going to teach was unnecessary repetition of what they could do already. A lot of wasted time and frustration on both sides was avoided. See

Giacobbe, Mary Ellen 'Kids can write the first week of school' ***set*** No.2, 1981, item 7, and in *Best of* ***set****: Writing*, item 3.

Example 11.

A secondary teacher kept a diary of how each day had gone, particularly her own decisions. She discovered that all her decisions, no matter how instantaneous or off-the-cuff, were rational. Some had emotional content, and some were not always for the best, but they were all justifiable. A cheering discovery. She worked out ways to make the hundreds of quick decisions every teacher has to make each day, even better, and less stressful. See

Rosen, Juliette 'Moment-by-moment decisions', ***set*** No.2, 1991, item 3.

Example 12.

Many teachers have collected lists: of what their pupils are reading; what sports they play; what pocket money they get; what their hopes and fears are; what homework they get, what homework they do, what subjects they like; what TV they watch, and so on, and on. It is all good stuff and takes the guesswork and prejudice out of judgements, estimates, assessments, demands. See, for example,

Barnhart-Thompson, Greta 'Teenage perceptions in a still nuclear age', ***set*** No.2, 1990, item 15

and

Dickinson, Kym 'Teasing and Bullying', ***set*** No.2, 1992, item 2

Most 'classroom' research is easily repeated in other classrooms, and so teachers can see if the results apply to them. If Mary Ellen Giacobbe can check how well her kids can write, so can I; if Juliette Rosen can check her own decisions, so can I; if Kym Dickinson can check how much bullying is going on, so can I.

Action Research

One sort of applied research is not so easy to pin down, and certainly impossible to repeat. Where the researchers (often teachers and academics co-operating) are looking for ways to change what is being done, they may decide to check what is happening, then make changes as they go along, and check the effects straight away, as the basis for further changes. Thus the researchers do not stand back, careful not to interfere, keeping a 'scientific' objectiveness. Here teachers, children and researchers are all in action together, promoting change.

You have to be enthusiastic and sure of yourself to feel confident that you are acting as a 'proper' researcher in such situations. I can't help being a bit overwhelmed at times by the enthusiasm of action researchers and I feel any innovation is doomed to success as they charge ahead. However, big changes can be made to school practices by enthusiasm, and bold innovations are exciting to hear about. A recent example is:

Poskitt, Jenny, McAlpine, Don, Ryba, Ken 'Achieve's Choice', *set* No.2, 1993, item 7

Mavericks

The items that do not 'belong' under any heading have been, of course, the greatest fun to find and get published. Humorous articles often make very important points, see

Perry, William Jnr. 'Examsmanship and the liberal arts', *set* No.1, 1993, item 8

and

Bowler, Peter 'The decline in jumping standards', *set* No.2, 1979, item 8

and

Leapman, Michael 'Dr Fox', *set* No.2, 1988, item 8

and

Phi Delta Kappan 'Teacher evaluation form — Socrates', *set* No.2, 1992, item 10

Quite startling have been revelations about how unequally education is spread. I found two New Zealand items. I'm sure there are Australian examples I have not found.

Hughes, David 'A great waste of talent', *set* No.1, 1992, item 14

and

Wilson, Christine & Dupuis, Ann 'Poverty and performance', *set* No.1, 1992, item 15

Some of the toughest to edit have been the maverick thinkers: for example, anything by John Raven is stimulating and out of the usual run, but he is hard to edit. Richard White is another who puts old ways of doing things under the rational spotlight. And recent penetrating analysis of pressures on education have come from Ray & Mickelson (No.1 this year) and Liz Gordon (in this issue). See

Raven, John 'The crisis in education', *set* No.2, 1992, item 11

and

White, Richard 'Questionable assumptions underlying secondary school classrooms', *set* No.2, 1993, item 6

and

Ray, Carol & Mickelson, Roslyn 'Restructuring students for restructured work', *set* No.1, 1994, item 8

and

Gordon, Liz 'Some schools are more equal than others', *set* No.2, 1994, item 5

Occasionally *set* has been ahead of the pack, publishing Peter Warr and Saul Levine on unemployment before it hit hard; Mintzberg on management before schools became businesses; Michael Reid on the demands of the workplace before literacy/numeracy hit the headlines; Barbara Tizard on nuclear education when peace education was still a dirty word. A few times politicians got shirty, but have since proved to be behind the times. See

Smith, Gillian Crampton, of The Family Planning Association (SW London Branch) 'Too Great a Risk!' *set* No.2, 1974, item 6

and

Levine, Saul 'The psychological and social effects of youth unemployment', *set* (NZ edition) No.1, 1981, item 5

and

Warr, Peter 'Work, jobs and unemployment', *set* No.1, 1988, item 8

and

Mintzberg, Henry 'The manager's job: folklore and fact', *set* No.1, 1985, item 10

and

Reid, Michael 'They must know their alphabet...', *set* No.2, 1984, item 15

and

Tizard, Barbara 'The problematic aspects of nuclear education', *set* No.1, 1985, item 9

And how does one catalogue a wonderful account of mental jujitsu in the quest for linguistic awareness, truth and beauty?

Toppins, Ann Davis 'One-pulse words: short, sweet and to the point', *set* No.2, 1985, item 7

Conclusions

1. Teachers expect too much of 'education' researchers – most of them are not doing, and do not set out to do, research of relevance to teaching and learning.
2. Researchers expect too much of teachers – teachers haven't the time to sort out the conclusions that apply to them in the few relevant papers. They certainly do not have time to sort through the thousands of papers by researchers in the medical, genetic, demographic, anthropological, psychological, fields.
3. It would be wise for someone to finance a continuing **search** programme. It would track down, and put onto data-bases, and publicise, teaching-useful research from other fields. I have given examples from *set*, but these I lit upon rather unsystematically; there must be lots more out there.
4. Pure research is very important to teaching. Very few 'educational' researchers are equipped to do it: questionnaires, sampling algorithms and regression analysis of variants are not enough.
5. Noting what the forward looking 'maverick' thinkers have to say is as important as noting the pure research: we do not want to become efficient at teaching what ought not to be taught — racism, consumerism, violence, over-simple economic theory, new-age science... Remember: 'They're dying in the streets, Dr Pasteur! Let's get out to help. Grab a leech!'
6. In-service courses on observation techniques plus simple statistics, followed up by doses of help and encouragement from 'Research Advisors', would boost the usefulness of teachers' enthusiasms no end.
7. University 'Education' faculties and independent research establishments, should discuss how far away from teaching and learning they want to be.
8. Is one third of research time on learning and teaching by 'education' researchers enough? If 'education' researchers cannot/will not do what teachers require, someone else should. Education ministers should be improving the efficiency of their employees by getting done the research those teachers need. And in these days of 'user-pays' perhaps teachers (through their unions?) should also be funding both pure and applied research that bears directly on day to day teaching. At least unions could insist on in-service training and access to research advisors so that teachers can do their own, useful, small scale, but enlightening classroom research.

Llyn Richards
August 1994

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item 3

set
number two 1994

HOW PUPILS LEARN

Graham Nuthall and *Adrienne Alton-Lee*

MANY YEARS of patient years of research have discovered how ideas get formed, embedded, and remembered.

Introduction

It is only in recent years that research on teaching and learning has looked at what actually goes on in the day-to-day life of the classroom. Consequently, it is only in recent years that research has begun to provide real answers to the question: How do pupils learn? and to the even more difficult question: How do teachers affect the way pupils learn?

This article is about pupil learning. When we look at the activities that take place in a primary school classroom during a typical social studies or science unit, what kind of learning is taking place? The pupils may be flicking through library books looking for answers to questions the teacher has set. They may be writing a report about their observations or the results of an activity they have just completed. They may be listening to a class discussion, occasionally raising their hand and answering the teacher's question. They may be swapping felt-tipped pens as they colour the headings and diagrams in their project book. What do the pupils actually learn during these activities, and, more important, what will they retain months or years later?

The Understanding Learning and Teaching Project at the University of Canterbury is about finding answers to these questions. We are now completing the sixth of a series of studies of pupils' experience that have been designed to discover how classroom experience determines what pupils learn and remember, and how social and cultural factors such as gender and race structure that learning.

Kim and the Medieval Charter

The best way to describe what we have discovered about pupil learning is to introduce you to some of the pupils whose experience we have studied.

Kim was a 10-year-old in a standard 3 (Year 4) class that was studying life in medieval England. He was a cheerful articulate boy who sometimes struggled to achieve as well as most of the others in the class. The teacher had designed the unit on medieval life to include a variety of activities (building a model of a medieval village, listening to the story of a page boy's life, completing worksheets on significant events in the Middle Ages, spelling activities with key words, and so on).

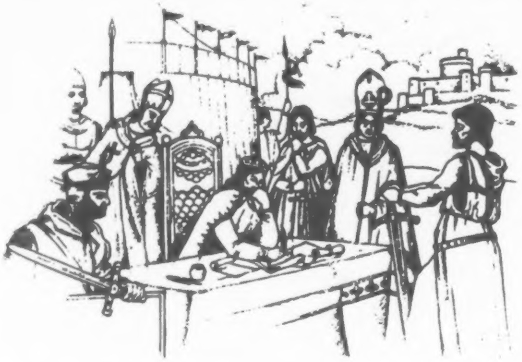
One of the concepts that the teacher wanted her pupils to learn about was the concept of a public 'charter', the most famous example being the Magna Carta. When we interviewed Kim soon after the class had completed the Medieval unit, he described a 'charter' in the following way:

> Charters, I think it was, showed people directions for moving about the towns, cause there was charters in the middle where the market was, I think... Um, I can remember a person in the middle of the road with a scroll... Um, and reading things. Yes, Ms A. was telling us about it. I hope I haven't muddled.

A year later when we interviewed Kim again to find out how much he still remembered, he described a charter in the following way.

> ... I think, ah, no, um, there's this thing I can remember. Well, there's, something, in the picture was a cross road, well, lots of roads joining into it and there was the stocks and people were throwing eggs at this person in the stocks, and then I think I heard something about a man stands in the middle there, and if someone wants to go somewhere, they go and ask him where to go.

We knew that before the unit Kim had no idea what a charter was. Our observations and recordings in Kim's



20 MAGNA CARTA

The place is Runnymede, a meadow by the Thames near Windsor. The year 1215. The man with the crown is John I, King of England.

John has been a treacherous king. He has murdered his nephew Arthur. He has quarrelled with the Pope. Now, even his own barons are against him because of his harsh taxes.

The barons and bishops have gathered at Runnymede and made him listen. They have written a GREAT CHARTER (MAGNA CARTA). It sets out all the rights of free men. It means justice and fair taxes. The King is furious, but he has no choice. He must seal it with his ring.

At first Magna Carta only helped the rich, not the poor. But later on it helped the British to work towards justice and freedom for all.

class during the Medieval unit showed that he had encountered material on medieval charters on several occasions. First, there was a worksheet on the Magna Carta. This had a picture of King John signing the Magna Carta and an explanation of the picture ('The barons and bishops have gathered at Runnymede and made him listen. They have written a GREAT CHARTER (Magna Carta). It sets out all the rights of free men. ...' etc.). Kim read this worksheet and wrote answers to questions about the Magna Carta story.

Several days later, when the class was discussing living in a medieval town, the pupils were asked to copy down from the blackboard a set of sentences about the medieval town ('The market place was the centre of town. People bought and sold goods there, the town crier made announcements, and it was a place where criminals were punished. A charter was a written promise giving the town its freedom. ...' etc.). The class were given an outline picture of a town market place and asked to paste it in their project book alongside the sentences. The picture (below) was a busy scene with people, stalls, animals, and a man in the stocks being pelted with eggs. Kim spent some time colouring that picture.

The next day, the word 'charter' came up during the morning spelling activity. The teacher had written a set of sentences on the blackboard, with a word missing from each sentence. The teacher discussed each sentence with the class and the pupils had to learn the missing word for the weekly spelling test. One of the sentences for this day read 'A written promise called a _________ showed how a town had been given its freedom.' The following discussion took place about that sentence.

Pupil: [reading sentence from blackboard]: A written promise called a 'something' showed that the town had been given its freedom.

[Pupil knocks on door of classroom, enters to get lunch orders].

Teacher: What was it called? Celia?

Celia: Charter?

Teacher: Right. [To lunch-order pupil]: Are you coming with the charter?

Lunch-order pupil: Any lunch orders? ...

Teacher: Right. Good girl. I wonder if anyone can tell me what the root word is for charter? Bev?

Bev: Chart.

Teacher: Right. -Er. Chart – er.

This discussion continued for the other sentences on the blackboard about medieval towns, mayors and market places. Later Kim copied these sentences from the blackboard into his project book.

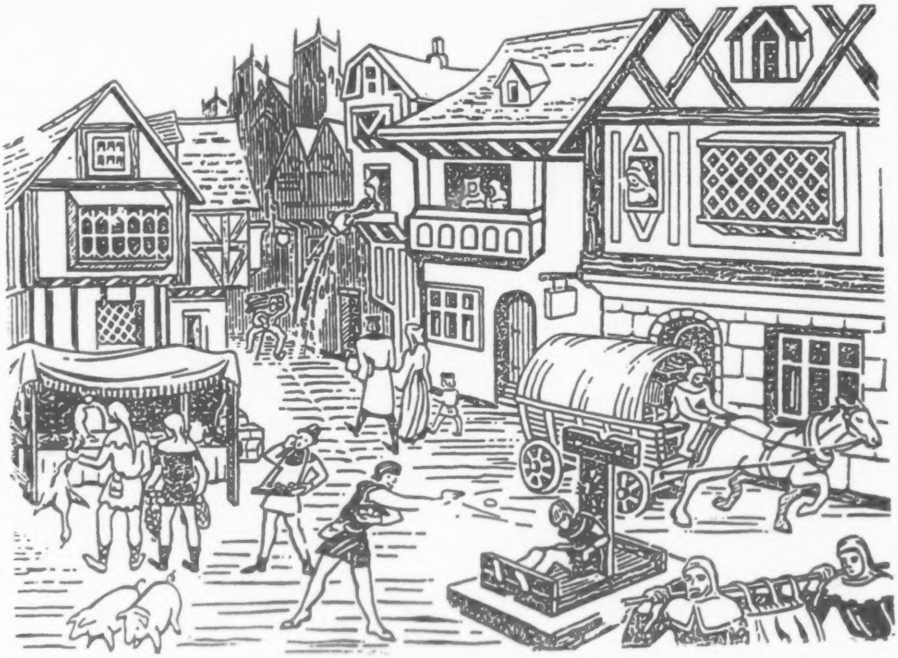
These were the three occasions when Kim's experience included specific reference to the concept of a 'charter'. Kim also had other relevant experiences that were about the activities of the 'town-crier' and about how medieval towns might develop at cross-roads and close to river transport.

When we relate what Kim 'learned' about the medieval charter to the content of his classroom experience, it is clear that what he 'learned' is an intelligent interpretation of the information that was available to him. The exception is the information about the Magna Carta which he seemed to have forgotten. He recalled that charters were connected with towns, market places, town criers and charts. Market places were associated with cross roads and people in stocks; town criers with reading scrolls and making announcements; charts with maps. But Kim had not just recalled what he had heard and read. He had turned the elements of his experience into a new idea, a new concept that made sense, to him, of this experience.

The Understanding Learning and Teaching Project

It was from the analysis of pupils' classroom learning of each of hundreds of ideas, concepts (such as a medieval charter) and skills that we developed a model of how learning takes place in the classroom. These examples came from four of our studies of pupils' experience during curriculum units in science and social studies (including the unit on life in medieval England).

We began each study by talking with a teacher and iden-



tifying a curriculum unit that the teacher was planning to teach. On the basis of these discussions we developed a test that covered, as far as possible, every idea, concept, or skill that the teacher hoped his/her pupils would learn from the activities and resources in the unit. The test for each unit contained about 100 items.

At least a week before the teacher began the unit, we set up audio and video recording equipment in the classroom and ran practice observation sessions. This was the time when the teacher and the pupils became familiar with our presence and we learned how to work unobtrusively in the classroom.

About a week before the unit began we administered the test. We read the test to the pupils over three separate sessions to avoid fatigue and to lessen the effects of any reading difficulties. At this time we also selected three or four pupils whose experience and learning would be the focus of our observations. We selected them to represent differences in gender, level of achievement and, where possible, ethnicity. Neither the teacher nor the pupils were aware of the identity of the selected pupils until after the unit was completed.

Through each of the units we had one observer for each selected pupil. The role of the observers was to keep a running record of all of the pupil's activities, all the resources being used, and all the things the pupil produced (making, writing, colouring, scribbling, etc.). The observers rotated from one selected pupil to another to avoid any bias in the recording. Initially we had a single audio and video recording of each class, but in the more recent studies, each of the children has worn a small broadcast microphone that has allowed us to record everything the child said or heard throughout the unit. In the most recent studies we have made use of small video cameras that have provided continuous video recordings of each pupil.

About a week after the unit was completed we gave the class the test for the second time. We then carried out a series of interviews with each of the selected pupils to ask them what they recalled of their experiences during the unit. In these interviews we went through every item in the test and asked the pupils what they remembered about learning the content of each item.

A year later, we gave the test for the third time and again interviewed each of the selected pupils.

During the data analysis phase, we transcribed all the audio recordings and collated them with the observers' records and further information from the video recordings and the copies of resources and pupil work. This collated data was then broken up in order to create a separate data file for every item in the test. For each pupil there was an 'item file' which contained observations and recordings of every detail of the pupil's experience that could possibly be relevant to learning that item. The account of Kim's 'learning' of the concept of a medieval charter is a much abbreviated example of an item file.

Over the years we have been involved in the project we have tried many ways of analysing these item files in order to discover what it is that determines why pupils learn and remember some concepts and skills and not others. The result is a model of the learning process that describes how classroom learning takes place and is precise enough to predict with more than 80 percent accuracy exactly what each pupil learned and did not learn.

Characteristics of Pupil Learning

Kim's concept of a Medieval charter is an example of how learning involves the intelligent interpretation of experience. Before describing the model of learning, we need to introduce several more important aspects of the learning process.

Tui and Jan were two pupils in a Standard 3 (Year 4) class that was doing a unit on the weather. As part of the unit the teacher wanted the students to learn how to record the weather each day and to relate their records to the weather map published in the newspaper each day. The pupils needed to learn, among other things, how wind direction and speed are recorded and how these are represented on a weather map. This included learning that winds are identified by the direction they come from.

Before the unit began, neither Jan nor Tui knew how winds are named. When asked soon after the unit how winds are named Jan said: 'I would say which direction it is coming from. Cause when you say its coming from the west, they just call it a westerly wind or something like that'. Tui said he didn't know and couldn't remember anyone talking about it during the unit.

The first time the teacher referred to naming winds was on the fourth day of the unit. The teacher had instructed the class about how to record the weather each morning. The pupils worked in small groups and recorded temperature, cloud types, wind speed and direction. On the afternoon of the fourth day, the teacher discussed the pupils' weather records.

Teacher: ... Right. Wind direction. Who put a wind direction? What did you put Kate?

Kate: Ah, south.

Teacher: The wind's coming from the south?

Pupil: South.

Teacher: [pointing out class door] The wind was coming from somewhere over there?

Pupil 2: Yeah.

Teacher: Who agrees with that? ... (etc.)

During this discussion, when the teacher referred to the wind 'coming from the south', Jan put her hand up tentatively and looked at Kate as she spoke. Tui was studying his own weather record and moving other pieces of paper around on his desk.

The next day when the pupils were outside recording the weather, Tui discussed wind direction with the others in his group. He spent some time fiddling with the pin on his wind vane and then held it up to the wind.

Tui: [announcing to the others] Wind is... the wind is blowing that way. So what's that way, Tony?

Tony: I dunno.

Tui: What way's south? It's blowing up that way, so what's that?

The rest of the group ignored Tui and concentrated on recording the temperature until a few minutes later.

Tui: [writing on his weather record] Wind? What way's the wind blowing, Tony?

Tony: What way's the wind blowing?

Tui: That way? The winds blowing that way. That way's north, eh? South, eh? That way's south, eh, eh, Tony?

Tony: What way's it coming from?

Tui: I don't know. It's going that way. It's coming from the north.

Tui was confused about whether to record the way the wind was 'going' or 'coming from'. During the same period Jan was working with her group as they recorded the weather and asked to borrow a compass.

Jan: Can I please use yours? Mine's not in there. Could I? [places compass on the ground] Set it, um, there. Leave that one there. Alright? I'll tell you which way the wind's blowing. [holds up wind vane] ... Hurry up, wind, blow! ... Where's my sheet? It's south-east. It's blowing south-east.

Pupil: Where do you put 'south-east' in?

Jan: Under 'wind direction'.

Unlike Tui, Jan was clear about how to describe the wind direction. A few minutes later the class moved inside and the teacher started to discuss the copies of newspaper weather maps that he had distributed to each pupil in the class.

Teacher: ... Right, lastly, look at the map I gave out today... There's wind going to be sort of coming around in some way... perhaps the arrow we can see in the middle of the Tasman Sea might be the south-west wind bringing the wind up to us...

During this discussion, Jan was observed looking at the weather map and tracing her finger along the isobar lines. Tui was examining the thermometer his group had been using and was talking to his neighbour about it.

A little later the teacher gave each pupil a sheet containing photocopies of two weather maps from successive days. He talked about how to interpret the maps and to see how they changed from day to day.

Teacher: ... So we can now look then at the wind direction, and I want to look at the arrows there [holding up map and pointing to arrows] ... The arrow's coming down isn't it. Isn't that little arrow there coming down? [Jan whispers to herself: 'Yeah']

Teacher: Right. That would mean there are northerly winds. Who got northerly type of wind out there before?

Pupil: South-west.

Teacher: What direction was the wind coming from?

Tui: North west.

Teacher: From the north-west? What did you write down, Ken? [Tui calls out: 'North-west. It's north-west'. Jan whispers to herself: 'South-east']

Ken: South-west. [Jan whispers to her neighbour: 'I didn't. I put south-east']

Teacher: Who else put south something? ... Now, the arrow that's south-west is above the middle of the Tasman Sea, so my guess is that the low has come faster than they thought.... etc.

On the following day (Day 6) the teacher talked about warm winds ('We're talking about what sort of wind? What direction is it coming from? ...') and on Day 7, when the pupils were reporting back about their weather records, he challenged a pupil to defend her record of wind direction.

Teacher: ... What is the wind direction, Cissey?

Cissey: East.

Teacher: How do you know it is east, Cissey?

Cissey: Cause the wind is from that way.... etc.

During both these episodes, Jan appeared to be listening to the discussion, occasionally raising her hand to answer a question. Tui was studying his own weather record sheet and correcting what he had written on it. Later he fiddled with a music tape he had brought to school.

On the last day of the unit (Day 8), the teacher again discussed the relationship between the pupils' own weather records and the day's weather map from the newspaper.

Teacher: What does N.E. stand for, Kerry?

Kerry: North, um, north-east.

Teacher: North-east. What does that mean? North-east? What are they talking about? Cain?

Cain: Um, north-easterly winds, coming from the north-east.

Teacher: Brilliant!

During this discussion both Jan and Tui appeared to be reading the weather map and occasionally looking at the teacher or the pupil who was answering the teacher's question.

Although they were both in the same class, the learning experiences of these two pupils were different. During the unit, the teacher referred to the wind as 'coming from' a specified direction on three different occasions. On two occasions the teacher talked about the wind arrows on a weather map and described the wind they referred to (e.g. 'northerly winds'). On a further two occasions the teacher asked a pupil to explain the name of a wind ('North-east. What does that mean?') and the pupil provided an explanation ('coming from the north-east'). In addition, on five successive days, the pupils worked in their groups to record the direction of the wind.

Analysis of the data from all our studies has shown that pupils normally encounter an idea or concept several times during a curriculum unit.

> ***Two rules for learning***
>
> ***If the pupil is to learn and remember the idea or concept, then there have to be four different occasions when the pupil engages with that idea or concept in some way.***
>
> ***Each of these occasions should not be separated by more than two days.***

This number was reduced to three for older (11- and 12-year-old) pupils. It increased to five when the content consisted of indirect information and examples rather than explicit information. A precise set of rules for predicting what pupils will learn from different kinds of classroom experience is contained in our article in the *American Educational Research Journal* Vol.30, No.4, referenced in the **Notes** at the end of this item.

For Tui there were only two occasions when he was clearly attending to the discussion and looking at his own weather record. The first was when the teacher first discussed naming the wind direction (Day 4) and the second was when the teacher asked Cain to explain the wind direction. On the other occasions he was actively engaged in other things (fiddling with a thermometer, a music tape, etc.). This was not enough for him to learn the concept and he had no recollection of the teacher talking about it.

Jan, on the other hand was attending on each occasion. She learned the concept and recalled during an interview 12 months later how the teacher had talked about it.

Interviewer: Did it come up with Mr B last year?

Jan: Yes he gave us the weather map and we had to work out what temperature it was going to be and what way the wind was going.

Interviewer: How did you find that exercise?

Jan: Hard because I didn't know anything about the weather maps then.

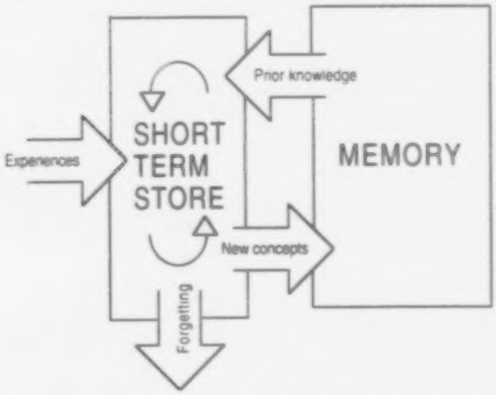
In addition to the class discussions, there were the occasions when the pupils were outside the classroom recording the weather. If Tui had understood how winds were named, this activity should have provided practical experience that ensured he learned the concept. However, the recording of the discussion among Tui's group showed that he was confused about how to record wind direction. He asked 'what way's the wind blowing?' This is a commonly used way of asking about wind direction that implies (usually unintentionally) that what matters is where the wind is blowing *to*. Tui, however, meant the question literally ('it's blowing up that way'). Later Tui reported that he had recorded the wind direction as the way the wind was blowing *to* (north-east, instead of south-west). This misunderstanding meant that Tui's wind recording activities each day produced the wrong learning about wind direction.

As a general principle,

> *One rule for learning/not learning*
>
> ***What pupils learn from their classroom experience is determined by their prior knowledge. Where this prior knowledge contains a significant misconception or misunderstanding, then the learning that would normally take place from class experience is subverted.***

The Model of Pupil Learning

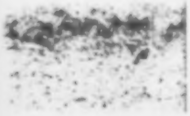
The explanation that we have developed of classroom learning is based on a model of the pupil's mind being made up of two parts (see diagram below). One part is the long-term store or memory where ideas, concepts and other kinds of knowledge and skills are stored more or less permanently. The second part is a working area or short-term store where individual experiences are stored on a temporary basis while the mind attempts to interpret and make sense of them. It is in this working area that new ideas and concepts are born.



Two processes take place in the short-term store. First, the mind tries to make sense of incoming experience by relating it to ideas and concepts already stored in memory (prior knowledge). Second, the mind sorts and integrates the mass of new experiences that are constantly entering the working memory. Experiences that are related to each other get connected and integrated into each other. When sufficient related experiences come together in the working store, they form a new idea or concept that is transferred to and becomes part of memory. The new idea or concept takes on a life of its own and is used to interpret and make sense of further incoming experiences.

What Happens When Learning Takes Place

Most of what takes place in working memory takes place automatically and unconsciously. The learning process becomes conscious when the process becomes difficult or requires the child's conscious involvement. For example, when making the connection between incoming experience and prior knowledge proves difficult, the child experiences a sense of puzzlement or incomprehension. This results in a conscious attempt to search memory for something that is like the new experiences and will help make sense of it. Finding a similar concept or experience helps to make sense of the experience and produces a sense of recognition or discovery.



The recordings we made of children's spontaneous speech using the individual broadcast microphones included not only the conversations the children had with each other, but also the conversations they had with themselves. We found that most of the children frequently talked to themselves, spontaneously expressing the thoughts and concerns that occupied their minds. These conversations provided us with a window on the processing that went on in the children's working memory. It was only a fragmentary record, because not all processing is conscious and not all conscious processing gets expressed audibly. But it provided enough evidence for us to suggest that learning involves at least four different processes. These processes do not necessarily occur separately or in any particular order. It is probable that they flow into each other and can occur simultaneously.

The talking-to-self and whispering to peers was not something that is normally visible to teachers or even observers in the classroom. We found that up to 60 percent of the talk recorded on the individual microphones was not recorded by our observers and probably not noticed by the teachers.

1. *Making Connections with Existing Knowledge*

We found that pupils frequently made connections between what was being talked about and their existing knowledge. In the following example from the weather unit, the pupils were responding freely to names they had not seen before. The teacher was introducing the class to the names of the major cloud types and was writing these names on the blackboard.

Transcript of public class discussion	***Transcript from private microphones***
T: ... this is the word. [*T* writes 'cumulus' on blackboard] *Pupil:* Cumulus.	
	Pupil (to self): Nebulite windows.
[*T* writes 'nimbus' on the blackboard]	
	Pam (to self): Numulus, nimbus....
Pupil: Nimbus	
	Oh yeah, nimbus. *Pupil 2 (to self):* Nebulus
[*T* writes 'cirrus' on the blackboard]	
	Rata (to self): Curious
Pupil: Syros. *Pupil:* Cirrus.... etc.	

Later, when another group of pupils were outside recording the names of the clouds for their weather records, they engaged in the same kind of word play. On this occasion each pupil was prompting the next to add further associations.

Pupil 1: Clapa nimbius aren't they?

Pupil 2: Crackanimbus? What are you talking about?

Pupil 1: Catty limbius clouds

Pupil 2: Columbius.

Many of the associations the pupils generated were more focussed and logical. New experiences reminded the pupils of relevant prior experiences. In the next example the teacher was handing out copies of newspaper weather maps. The maps reminded Pam of her life after school and she shared this with a peer.

T: ... I'm going to give you
two for each group. All it is,
is today's weather map from

The Press...
That's all it is...

Pam (whisper to peer): I go to *The Press* every day 'cause that's where my father used to work...

The tasks set by the teacher also stimulate pupils to make connections with their personal experiences. Our recordings showed that pupils frequently answered and commented on teacher questions and other pupils' responses during class discussions. In the following example, Pam was sure she knew the name of a 'barometer' and expressed her frustration to her neighbour, although the question was not directed at her.

T: What's it [a barometer] actually measuring? It's measuring something rather special
Pupil: Heat
T: What measures heat?
Pupil: A thermometer
T: So it's not a thermometer is it? It's a barometer.
Pupil: The weight of air.

Pam (whisper to peer): Oh what do they call it Something bars, bar...

Pam's whisper to her neighbour was also a display of her (presumed) knowledge. Such displays formed an important part of the ways in which the pupils interacted with each other in class.

2. *Elaborating the Content*

The process of making associations between new experiences and existing knowledge merged with the process of extending and elaborating the content of new experiences. In the following example, when the teacher was talking about using a thermometer to measure the temperature outside, Rata made the logical connection with using the thermometer to measure a person's temperature. This was not a connection that was talked about by the teacher or a connection that the pupils might have been expected to make in the context of a weather unit.

Pupil: 'Cause it tells you how hot it is.
T: Does it? What about it tells you that it's hot?
Pupil: The, um, the thing that goes up.

Rata (to self): Temperature, if you're sick.

In the following example, the teacher was helping the pupils to interpret a weather map. Pam has made the connection between what the teacher was talking about (the 'L' on the map) and the symbol-key underneath the map.

T: So you could say that the 'H' in Map A has moved across a bit?
Pupil: Yep.
T: Would that be fair?
Pupil: Yes.
T: It looks like its moving across?
Pupil: Yes.
T: OK, and there's an 'L' comes in that wasn't there before.

Pam (reading to self): It's low pressure low pressure or depression.
Pam (to self): It's not as big.
Pam (to self): It's low pressure or depression.

There was considerable evidence of pupils' minds elaborating and extending what the teacher was talking about, finding connections with their own experience and with our sources of information available to them.

Pupil 1: The red sky at night is the shepherd's delight.
T: Is it?
Pupil 2: It's a shepherd's warning.
T: Is it? Are you sure?

Rata (to self): Orange. The sun would be setting and the sun would be orange.

3. *Evaluating Truth and Consistency*

In addition to finding associative links and creating elaborations, the pupils' minds are also engaged in evaluating the truth and consistency of the ideas and associations their minds produced. In the following example, the class was discussing the rhyme about predicting the weather from the colour of the sky, night and morning. Rata was concerned that, in her experience, the clouds were not really pink.

Even though Rata was talking only to herself, she was asserting that what the teacher was accepting was in fact wrong, and that required a level of self confidence not shared by many pupils.

What counts as right or consistent is itself something that has to be learned and becomes part of the process of evaluating experience and ideas. In the next example, the teacher was asking the pupils to report back the list of weather words they had produced in their groups.

T: Ned?
Ned: I've only got one and that's... muddy.
T: (writes on blackboard) Muddy.
Ned: Icy
T: Icy. We've got icy somewhere, haven't we?
Pupil: Yes

Pam (whisper to peer): Oh, that's not weather.
Peer (whisper to Pam): See, I told you it was a weather word. See. See. You never listen.

4. *Developing Metacognitive Awareness*

In addition to being engaged in learning processes, the pupil's mind also learns to monitor its own learning. For example, it is important to be aware of what is strange and what is familiar, what is likely to be in memory and what is not. This awareness guides what the mind needs to attend to and when it is worthwhile trying to find something in memory. Such self-awareness and self-monitoring is called metacognition. Pupils' spontaneous comments indicate that they are constantly engaged in self-monitoring processes. In the following example, the teacher was talking about a compass and how it works.

T: What's it going to do for us, Lara?
Lara: It tells us what is north, east, and south and west.
T: How does it do that, therefore, Noel?

Pam (whisper to peer): I know how it works. My father's got one. I mean my mum's father.

Pam had decided that she knew all about the compass and didn't need to pay attention to the teacher's description. She made the same judgement about the barometer that the teacher discussed with the class two days later.

T: Because we have these machines [barometers] here. This is a school one which has unfortunately been messed up by somebody.
Pupil: I've seen that
T: It has got on it a little hand...

Pam (whisper to peer): I know how these work. My granddad's got one of those.

From other evidence it was clear that Pam had little understanding of how the thermometer and the barometer worked. Her personal assessment of what she 'knew' meant that she paid little attention to what the teacher was saying.

What the evidence from our studies has shown is that the pupils' minds are constantly active as they engage with their classroom experiences. During the time when new experiences are held in the short-term store, their minds are:

1. making connections with their existing knowledge in order to comprehend these experiences,
2. using the newly created connections to elaborate and extend the content of the experiences,
3. evaluating the expanded content so that logically related experiences get connected to each other and separated from other experiences, and
4. dealing with inconsistencies and contradictions.

The product of this processing is the generation of new ideas and concepts which get transferred to long-term memory and become a part of that knowledge by which pupils evaluate and interpret further new experiences. As the examples of Kim learning about 'medieval charters', and Tui learning about 'naming winds' indicate, this process can be subverted by the existence of misconcepts or inadequate experiences.

How do Pupils Learn How to Learn?

These learning processes are themselves learned. Even though they are mostly automatic and unconscious, they are processes which develop during the process of learning itself. As the research of Piaget, Vygotsky and other more recent researchers, for example Doise and Mugny, has shown, the way we think reflects the way we have learned to interact with others and with the world around us. Thinking processes do not arise, as it were, from within the mind, but as the imitation within the mind of processes that are learned in interaction with other people.

Our data provide examples of the social processes that provide pupils with models for internal thinking processes. In the following example, Jan and her group were discussing whether it snows in Christchurch where they live. The elaboration of content that we have described above as a learning process taking place in the working memory, occurs here as a social process in which one child's comment is the cue for the next child's comment, and so on.

Pupil: No, it's not snow.

Pupil 2: Doesn't snow in New Zealand.

Jan: It does not.

Pupil 2: Not in Christchurch.

Jan: It only snows in the mountains.

Pupil 2: And Mount Cook.

Jan: Yeah.

Pupil 2: And Mount Egmont and Mount everything.

Jan: Mount Egmont I love. I've been over there. I've got a T shirt of Mount Egmont.

Pupil 2: Mount Tekapo?

Jan: Yeah.

Pupil 2: I suppose that is.

Jan: No. And there's, um...

Pupil: It just about snowed the other Friday. Last Friday. That was thick cloud.

Jan: The clouds are, um. . .

Pupil 2: Sheep clouds.

Jan: Yeah. Sheep clouds, all puffy sheep clouds. Baa lamb clouds.

The process of evaluation also occurred as part of the social processes of the classroom. In the following example, which is taken from a Form 1 (Year 6) class studying life in New York, Ann shared with her friend the problem she had telling east from west. The teacher had been pointing out where New York was located on a map of North America.

T: [pointing to map] New York is... you can t see precisely... it's right on that point there. It's on the north-eastern coast of the United States, at the mouth of which river? *Jon:* [quietly] Hudson.	*Ann:* I thought it was on the west. *Julia:* I thought it was on the west too. I always get east and west mixed up. *Ann:* It's not west at all.
T: Your memory... your memory! *Pupil:* Hudson River.... etc.	*Ann:* (to self) West. West.

The nature of this social interaction is structured by the relative status and influence of participants. In the classroom the processes by which pupils understand experience and evaluate its truth and consistency are interrelated with the processes by which they negotiate their status and social roles. In the following example, Pam and her group are creating a list of weather words.

Pupil: Leaves.

Pam: Leaves are not part of weather.

Pupil: 'Tis so.

Pam: It is not.

Pupil: Leaves roll on the ground.

Pupil 2: Wind blows them.

Pupil: Winter makes them brown, you fool.

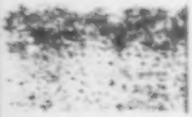
Pam: But that doesn't make weather.

Pupil: Want to bet?

The solution to what was right in Pam's group was determined by betting. Truth had become a matter of who won the bet. Bets of this kind between children are determined by social dominance. Negotiating and sustaining social dominance strongly affects how pupils value their own knowledge and ability. The following are two excerpts from the continuous interaction that went on between two boys in the Form 1 class that was studying life in New York. At stake was their relative status, socially and intellectually. In these excerpts the teacher was discussing the content of maps of New York that the pupils were working with.

T: ... a large number of skyscrapers, that you folk have been talking of, want you to be able to identify at least three of those. So, we'll just have a look. I've marked them in. That one there [pointing to worksheet map] and that one there, and that one there... [Five minutes later]	*Joe:* [carrying on own discussion] Don't be a jerk. Central Park. *Ricky:* Give me a look (at map). *Joe:* Central Park.
T: [listing the boroughs of New York]... The Bronx. *Pupil:* Queens, Brooklyn. *T:* Last, but not least? *Pupil:* New Jersey City. New Jersey City. *T:* Have a look at that one...	*Joe:* God, you're dumb. . . *Ricky:* I, dumb? I, dumb?

As this kind of interaction goes on, social dominance, status, ability and knowledge get mixed up together, so that the social process becomes inextricably intertwined with the processes by which the pupils exchange and evaluate knowledge. In relation to Ricky, what Joe said was true by virtue of Joe's superior status and self-asserted ability.



> Between them all the time is togetherness, so that learning is so mixed up with relationship that it becomes part of it. (*Sylvia Ashton Warner*

Because learning processes are socially constructed, then those factors that structure social interaction have a deep effect on how students not only learn to think about themselves on their own abilities, but also on how their minds work. A pupil may be constantly told that she/he is dumb and what she/he has to say is not worth listening to. This becomes the model of argument and discussion that the pupil incorporates into her/his own way of thinking. Thoughts arising in the mind are treated as unlikely to be true. Associations and elaborations of ideas are thought of as likely to be valueless. The probability of the mind continuing to process new classroom experiences diminishes, or becomes something that the pupil keeps hidden.

Because for some pupils, the content of class activities and discussions is seen as irrelevant, remote and even threatening, the classroom becomes an alien place. For example, girls may find the discussion constantly returns to topics and examples from the lives and experiences of boys. Venturing into the discussion invites ridicule. For Maori pupils (and other minority groups) the classroom is unlikely to be a place where their experience is included or valued. The following excerpt from the unit on the weather illustrates Tui's response to a classroom context that seemed to him to be largely irrelevant. The teacher was talking about how a compass works. Tui sang his own songs, removing himself from an alien world.

T: It's the needle of it [compass] isn't it? It points north. If we use this thing [magnet] as the needle, it's pointing north. It doesn't matter where the card goes.	
It's the needle that tells us. Now if we want to be clever, we can use the card to help us. We know that's north, aiming through there. Which way is east?	*Tui (singing to self):* Here comes the world... The giver is one... Come together as one...
Pupil: Um, that way. *Pupil:* That way. *T:* So how do you find it with the card, Norman? ... etc.	*Tui (singing to self):* People start to lend a hand... the greatest gift... We are the world... we are the children to make a brighter day... So let's start giving....

As this kind of alienation occurs, the learning processes, generated by the mind's natural desire to make sense of experience, fail to engage with classroom experience. Not only does learning cease, but the development of the learning processes ceases with it. In other articles in ***set*** we have given examples of how gender and race 'structure' the ways pupils interact with classroom experience and learn to think about themselves and their abilities. What we are claiming in this article is that gender and race and other cultural factors have a profound effect on the ways in which the pupils' minds engage with experience.

Structuring Teaching to Enhance Learning

The implication of our research on classroom learning is that pupils' minds are constantly active, interpreting and trying to make sense of their experiences. Learning, of the kind that is required in school, will occur provided pupils encounter a new idea or concept on at least four different occasions. If the initial occasions are too far apart (more than two days) then they will be forgotten before effective learning can occur.

The problem the teacher faces is to ensure that the pupils' minds are engaged with the new material. This requires two things. The tasks and activities that the teacher sets up for the pupils must engage their interest and focus their minds on the relevant content.

Many of the tasks that pupils are asked to do in classrooms keep them busily involved in peripheral activities. Time is spent on organizing materials, finding resources, asking for help, ruling margins, pasting, swapping felt pens, copying, putting away materials, day dreaming, and so on. It takes considerable skill on the part of the teacher to structure tasks in such a way that successfully completing them requires the child to think seriously about the **content** for any length of time.

Engaging the pupils' interest has many different dimensions. It involves making contact with the realities of the pupils' lives. The pupils must feel that the content of classroom experience is something of value and significance to them; that school and the teachers value their experience.

Teachers cannot turn the minds of pupils off. They continue to be active in alternative and sometimes unacceptable ways. What teachers need to be aware of is the danger of turning pupils minds off active engagement with the school curriculum. For example, sustaining the active involvement of the minds of Maori pupils and allowing their intellect to develop as freely as Pakeha pupils requires the formal and informal content of classroom activities to relate as directly to the lives and values of Maori pupils as it does to the lives and values of Pakeha pupils. Australian teachers will recognise parallel necessities in their classrooms.

Even when a teacher has established a classroom context in which the tasks are content focussed and incorporate experiences that the pupils value, there is still the need for constant monitoring of pupil involvement by the teacher. As the pupils learn and their minds create new concepts, the possibilities of serious misunderstandings are constantly present. Misunderstanding and the frustration and failure that comes with it will subvert the learning process.

Notes

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How do pupils learn to learn?

The researchers referred to in this section can be studied in

Piaget, J. (1951) *Play, dreams and imitation in childhood.* New York: Norton.

and

Vygotsky, L.S. (1978) *Mind in society. The development of higher psychological processes.* Cambridge, Massachusetts: Harvard University Press.

and

Doise, W. and Mugny, G. (1984) *The social development of the intellect.* New York: Pergamon Press.

The quotation from Syliva Ashton-Warner is from p. 104 of *Teacher*, London: Secker & Warburg, 1963.

Further references for more information about the Understanding Learning and Teaching Project

Alton-Lee, A.G., Nuthall, G.A. and Patrick, J. (1993) Reframing classroom research: A lesson from the private world of children. *Harvard Educational Review*, Vol. 63, No. 1, pp. 50-84.

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item 4

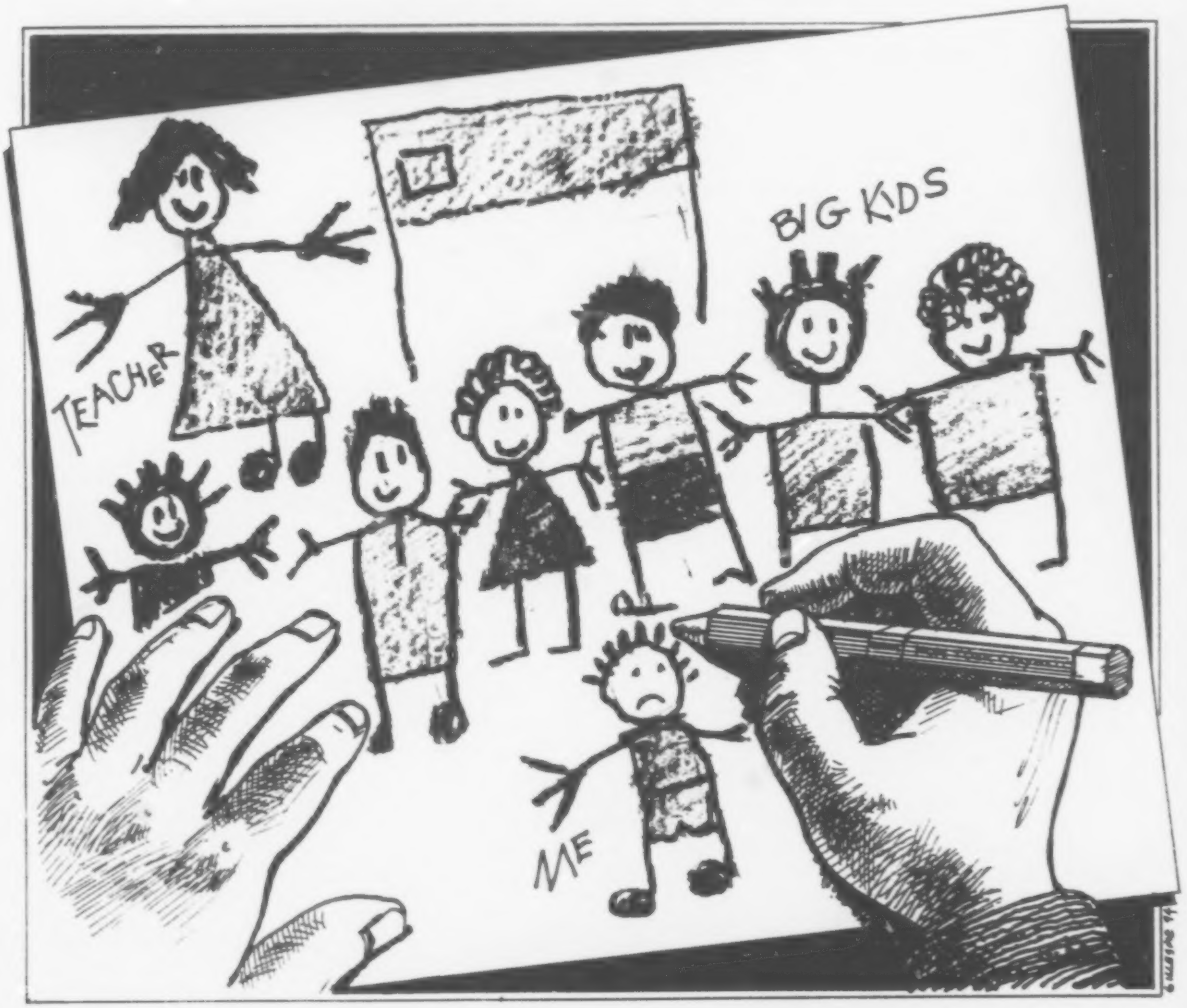
set
number two 1994

Drawing What You Know and Feel

Finding out what school beginners really think of teaching and schooling

Yvonne Burgess

ASKING VERY YOUNG CHILDREN to draw can reveal a great deal about how they are coping with school, what they are learning, and what they regard as important. Better teaching can follow.



EXPERIENCED TEACHERS seem to know intuitively when to be mother-substitute, first-aid nurse, resource organiser, counsellor, disciplinarian, demonstrator or instructor. Knowing what role to slip into requires some insight into how the pupils are interpreting classroom experiences; getting that insight is a skill all teachers hope to cultivate; it is very useful to know how our role, as teacher, is affecting the quality of learning. So it is beneficial to reflect on the reactions and perceptions of the children from time to time.

With older children, experienced teachers and researchers have gained considerable insight through questionnaires, diaries, sensitively run discussions, interviews and observations. In early childhood however, this is not so easy. It is obviously inappropriate to ask Year 1 pupils (NZ: J2/3) to fill in questionnaires, to give reasoned responses to complex oral questions, or to participate in thoughtful discussion about classroom practices. Observation is an extremely valuable way of studying young children, but for thoughts and feelings how can a teacher gain deeper insight? Realising the challenges inherent in working with six-year-old children, I set about the task of evolving a methodology which would allow me to study their perceptions of their teachers' roles and functions in a normal classroom. I was looking for a way for teachers to conduct 'action research' to increase their knowledge and understanding of their pupils' points of view.

As a lone researcher, and as a teacher upgrading my qualifications, I had no access to extra resources, assistants etc., and I was determined to establish procedures which could be applied by any classroom teacher who wanted to do some action research (with perhaps the assistance of a colleague or mother-helpers). A search of the literature gave me lots of ideas, but few researchers have conducted such studies with children in their first year of schooling. Certain principles, however, guided my choice of approach. The first was to conduct research which caused the minimum possible interference in the child's routine. Secondly, research about schooling should take place in the actual classroom setting to gain 'grounded insights' into *normal* behaviour.

To follow these principles (and to maintain simplicity) I gradually eliminated certain options such as videotaping, audio-taping, using photographs or stimulus pictures, or complex coding systems, and evolved the *Drawings and Focused Interview Technique*.

Several researchers have attempted to tap into forms of thinking through the study of children's drawings. They found that the drawings not only reflected children's cognitive awareness and maturity of understanding, but provided very useful focal points from which communication can be started. In my technique the drawings not only stimulated conversation but also illuminated the children's replies. It also provided a kind of 'snapshot' of each child's visual perceptions. Thus I combined drawings, oral questions and discussion, and supplemented these with observations (kept as a diary).

I evolved my methods in several months trial and error in Year 1 (NZ: J2/3) classrooms, then my final study was conducted in a colleague's classroom during the second term of the school year. The average age of the thirty children was 5 years 9 months. Although the children had a regular classroom teacher, they also met other teachers (for music, games, cooking and religious instruction), teacher's aides' and mother-helpers.

The Research

1. Since I was not the regular teacher of the class, I became a participant observer, assuming the role of a teacher's aide or assistant. I established a friendly, relaxed relationship with the teacher and children so that I was seen as an accepted, helpful member of the school staff. I participated in routine tasks and spent time in informal interactions with the children.

2. I began to keep a diary. I noted daily happenings, lessons, weather patterns, and general background information to assist the process of gaining 'grounded insights' when recording observations and responses of individual target children.

3. A semi-private drawing table was made available in a corner of the classroom. That way, distractions were minimized but the child did not feel isolated or uncomfortable. Care was taken to make a range of drawing materials available. Some children have distinct preferences because they have skills or because, for example, their teacher has said that certain media are for 'neat' work only and they felt inhibited by fear of not meeting set standards of 'work'.

4. To gain the interest of each child, I talked informally about some topic of interest before leading into a prepared invitation, asking them to draw a picture. The preamble usually went something like this:

> I'm very interested in all your ideas, and in the way you draw. I'd like to talk to you about school and what teachers do. Would you please draw me a picture about teachers to show me what you think teachers do? And then we can chat about your ideas.

The actual words varied slightly, depending on the 'warm-up' conversation.

5. At the drawing table, I showed interest in the drawing and then led into a semi-structured list of questions, moving from simple queries about the content of the drawing to more complex questions this way:

> What have you drawn in this corner?
>
> Can you tell me what's happening?
>
> Why is the teacher doing this?
>
> What else do teachers do after they do this?
>
> If you were a teacher, what kinds of things would you do?

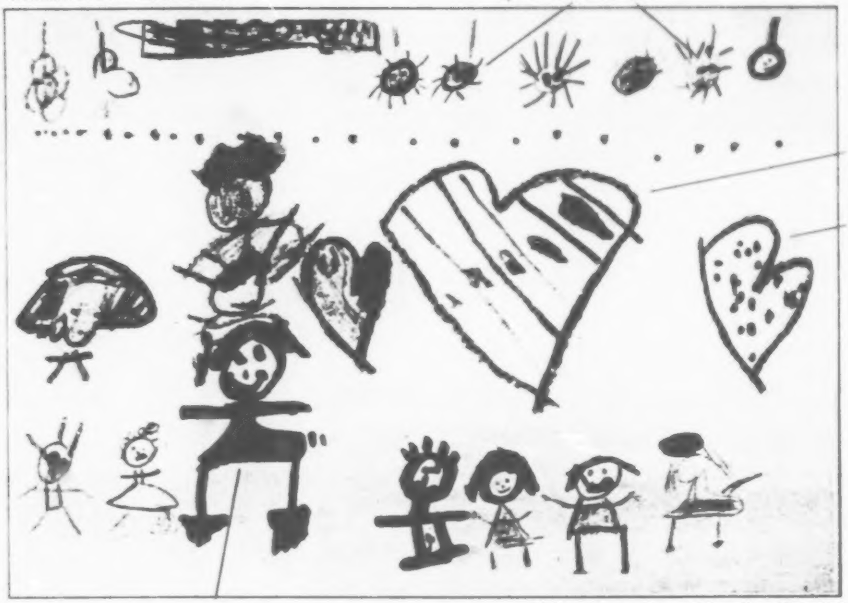
Field notes with the key phrases from the responses were written as soon as the child went back to classroom activities.

6. To check that the children's responses, behaviour patterns and interactions with me were not wildly different from those in normal classroom circumstances, I made diary entries and examined examples of the child's ordinary writing and drawing. (If the researcher is not the classroom teacher, close co-operation between the two is essential to cross-check how typical the drawing is.)

7. I then made an analysis of the *content* of the drawings and compared these topics with key phrases in the *verbal responses*. These were placed into categories for an overall picture.

Our teacher is telling some children to finish their sums

Teacher put our spiders up for everyone to see



These sounds come out of peoples mouths when we sing Teacher gives us the rhythm.

She teaches us to do work but we also have birthday parties and make puppets

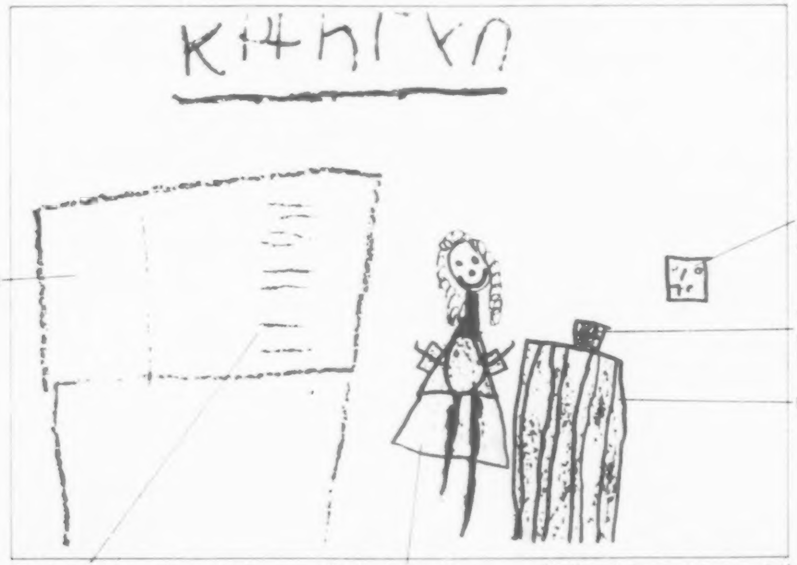
Teacher

[the other coloured drawing (Brook)]

For example, a content analysis showed that many children drew (1) the blackboard, (2) the teacher's desk, (3) books, and (4) pets. When working with a particular child the associated questions can check that his or her picture shows the parts of the classroom most significant to him or her. The same checks can be made for a whole class. In my study the vast majority of children drew 'happy faces', but one small, shy boy drew huge people surrounding him, and he told me in the interview that he was not at all happy because he couldn't see the teacher over all the 'big children'. As soon as the teacher saw this, she moved him to a less threatening seat.

Such results highlighted the differing perceptions the children had of the 'roles' and functions their teacher performed. For example, whereas the teacher saw herself as nurturer and a facilitator of learning experiences, the children didn't draw pictures and talk about the caring role of the teacher at all. Many of them drew the teacher in a didactic role, often standing beside a blackboard issuing instructions. In response to questioning, many children said the teacher *ought* to 'teach' them and 'tell' them what to do.

Other examples highlighted the children's perceptions that no-one really taught them to read, they did it themselves by reading at home each night! All the exciting reading activities and games provided by the teacher were dismissed as not being real 'work'. Were they influenced by parental attitudes? After discussing this point, my colleague decided to be more explicit to parents about how the activity based strategies she was using taught language and maths.



Blackboard

This is the calendar to do days and things

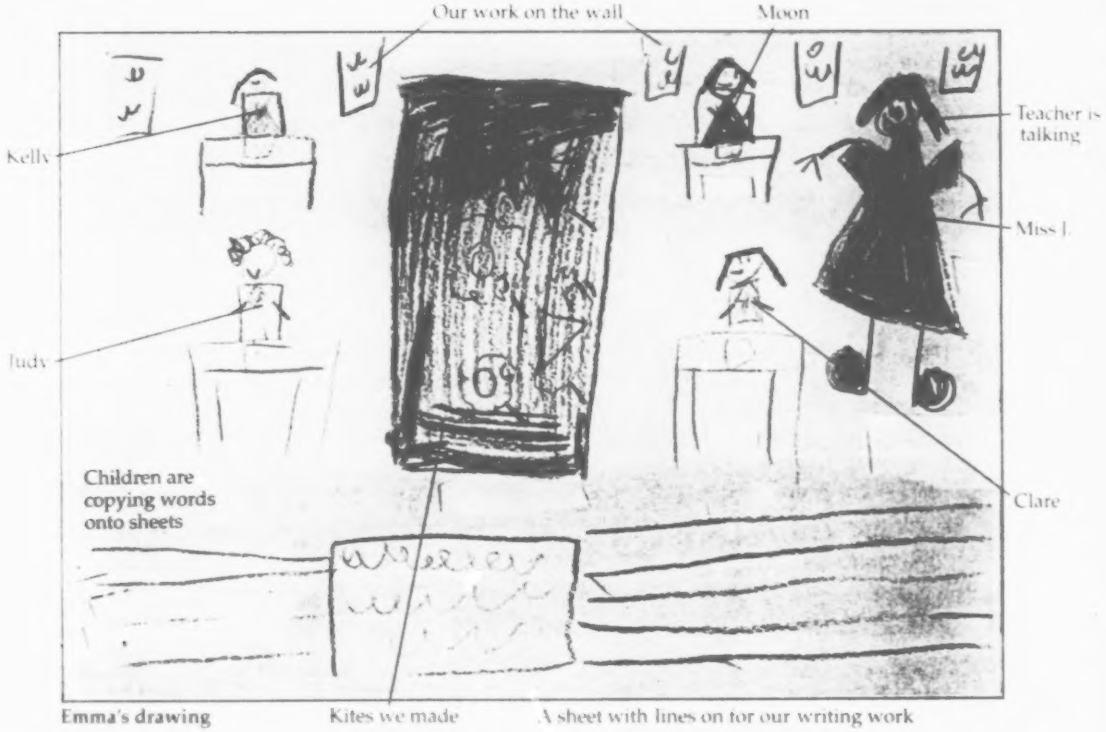
This is a book ready to read to us

Her desk

Big straight lines so she can write and show us the letters

Teacher tells us to do work

[Kathryn's drawing (xerox only)]


Our work on the wall
Moon
Kelly
Teacher is talking
Miss J.
Judy
Children are copying words onto sheets
Clare
Kites we made
A sheet with lines on for our writing work

Emma's drawing

On another occasion, my colleague was intrigued to receive indirect feedback on her classroom management practices. Emma's drawing (see attached) shows her teacher supervising a traditionally conducted handwriting lesson. She has included an example of the workpage at the bottom of the drawing, and told me that children 'copy words onto a sheet with lines on'. The only people identified working in the classroom are her friends, all female, but when questioned about what the others might be doing, Emma initially dismissed the inquiry with a shake of her head which indicated that she wasn't really interested in answering. However, after a quick gaze around the room and a pause for some thought, she informed me that the teacher 'does an awful lot of talking to Sam... he's not very smart so she helps him a lot'. After another pause she added, 'yes she talks a lot even when we are writing... she helps us so we can put words on our worksheet'.

This information prompted the teacher to reflect on the amount and style of help she gave to Sam; perhaps she should adopt a more subtle approach to avoid the unintentional reinforcement of the perception that he was 'not very smart'. After analysing key phrases used by the other children, we were both conscious of the fact that as enthusiastic teachers, we probably needed reminding that children think that teachers do talk 'an awful lot'!

Comments

The kind of information revealed by drawings and focused questions can help us present activities in different ways to benefit learning. For example, my colleague now spends more time pointing out the links between 'fun' activities and 'working'. She explains that maths games actually help to 'teach you about numbers' and word games will assist with learning to read.

In another situation, I found the methodology was very useful when a group of early childhood teachers were deciding whether to have computers in the classroom. We discovered that some of the children were totally unaware of computers, but over half the children had a very positive attitude towards computers, and considerable knowledge of them already. The tallies of the vocabulary used and the details they drew in pictures about computers gave the teachers a valuable base from which to plan computer based activities.

No two groups of children are alike, so we are constantly trying to understand their pupils. I hope that other teachers of young children will find this methodology a useful approach to getting a 'pupil's eye view'.

Notes

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set
number two 1994

...Some schools are more equal than others...

Schools and market choice in Aotearoa, 1994

Liz Gordon

SCHOOL ADMINISTRATIVE REFORMS in New Zealand have not promoted equity, in fact quite the reverse. Facts, figures and interview comments display the reality and are contrasted with the rhetoric.

THE POLICY DOCUMENT *Tomorrow's Schools*, published when NZ's Prime Minister David Lange was also Minister of Education, heralded a complete reform of educational administration in New Zealand; systems that had been in place, more or less unchanged, for more than 100 years. The aim of the new system was to improve the goals for education and provide an equitable national system for all children.

To achieve this aim, schools themselves would become the basic 'building block' of the education system. Responsibility for running schools would be devolved to each individual institution (although national guidelines would guide the limits of school autonomy). Education Boards and most regional services would be abolished or privatised, and the funds given directly to the schools, who would then be able to *buy* the services they needed. Schools themselves would be controlled by boards of trustees, made up mainly of parents of children attending the school.

It is now (1994) six years since that blueprint for the reforms was published. They were not introduced exactly as described. In fact numerous changes took place in the focus, intent, ideology, and strategy during the implementation process. The cumulative effects on schools of the reforms in New Zealand include a huge increase in the number and range of 'problems' being reported in the media: truancy, closed rolls and enrolment schemes, teacher and principal stress, health problems, relief teachers, hungry and/or cold children, social problems, violence and arson, to name just some. Every day there are more.

Ball, Bowe and Gold in 1992 studied school reforms in the United Kingdom concentrating on the changing relationships inside schools. It became clear to me that any such research in NZ should focus not on the teachers, but on issues of governance, and in particular boards of trustees.

The schools

Our research studied schools: 4 primary (2 'rich' and 2 'poor'); 2 intermediate (Years 6 and 7 in Australia) (both 'average' to 'rich'); 3 secondary (1 'poor', 1 'poor'-to-'average', 1 'average'-to-'rich') and 1 area (country) school ('poor'-to-'average').

Every NZ school has a *School Charter*, a 'contract' between the Board of Trustees, the majority of whom are local parents, and the government's Minister of Education. The *Charter* lists what the school is trying to do, against which it expects to be judged. Because of the requirements of the school charter, and certain types of funding being 'tagged' to particular social groups, every school has in-depth and up-to-date knowledge about its population.

Rich schools, poor schools

The 'rich' schools in this study have a high proportion of middle class pakeha (European) families, a low rate of single parenthood, low unemployment, few or no Maori or Pacific Island people but often a high Asian population. A key characteristic is stability of population; the turnover of students is very low.

The picture in the poorer schools is very different. In some of the schools more than half the families exist on social welfare benefits, and those in work are generally in semi or unskilled jobs. Maori and Pacific Island populations are much higher, as is the number in single-parent families.

One clear characteristic of the poor schools, especially primary, is the transient nature of the population. For example, a large proportion of 'Bayview' school's population moves each year, the roll fluctuates a great deal, and fewer than half the pupils enrolled at the present time commenced their schooling at 'Bayview'. There is also the temporary enrolment of the children of women staying at refuges (from domestic violence) in the school's zone.

Because of their larger size, secondary schools are more likely to have a mixed population. Both the 'average' secondary schools in the study draw from both poorer and wealthier suburbs. The area school takes in all the students (except those who are sent to boarding school) of what is a relatively poor country town. Although the area school has a population relatively poorer than the other two 'average' secondary schools, all three are attempting to become more attractive to the wealthier families in the community.

Boards of Trustees

There has been a major shift in the idea of what the Board of Trustees (BoT) should be. When they were set up in 1989 the emphasis was heavily on 'community representation'. However, the next government encouraged boards to see themselves more as 'directors' of 'successful businesses or enterprises'. This change in ethos is evident in all the schools in this research, and directly benefited the 'rich' schools at the expense of the 'poor' schools. Essentially, for the 'rich' schools there is no conflict between community representation and business experience because the parent population of these schools is made up primarily of successful business and professional people. This business orientation was further emphasised in the 1992 board elections. For example, here is a report of one school's elections:

> The current board of trustees has taken a new direction with the election of members with commercial and business backgrounds to the board. The previous chair was a teacher, whereas the current chair is a manager. The new treasurer also occupies a management position, and a lawyer has been co-opted onto the board as a parent representative. The business backgrounds of the current board members are seen as an advantage, given the current government's educational policies, aimed at making schools take a central role in the market place.

In the 'poor' schools, too, there is a strong perception that trustees need to have certain 'business' skills in order to run the school effectively. However, looking for 'skilled' trustees undermines the goal of having the community represented. In areas where half the parents are out of work, and many others are struggling as single parents on a benefit, such 'business skills' are hard to find. The struggle to find people with business skills often means that Maori and Pacific Island communities are badly under-represented on the boards of 'poor' schools.

> “…The ability of 'poor' schools to improve their status is minimal.”

The pool of business-oriented board candidates is also different: in 'poor' suburbs, instead of lawyers and accountants, local people experienced in business tend to be skilled tradesmen, middle management or owners of small businesses. One implication of this is that lawyers and accountants need to be *hired* to give advice which, in the richer schools, is given for free.

The conflict between community representation and business or professional skills is seen most clearly in the process of co-option. All schools are able to co-opt a number of people onto the board. In 1988 co-option was seen (primarily) as a means to ensure that the board represented its community, or to provide expertise in specific areas lacking on the board. In practice, there is conflict between these two goals, particularly in 'poor' schools. One secondary school, for example, has delayed co-option whilst it assesses its needs:

> … more women, single parents and unemployed parents, who are not represented despite there being, for example, 25 percent of students from single parent families. Additionally, an important issue is that the school also has a sizeable 'ethnic' population, and only one Maori representative. There was some discussion of further co-option in this direction, however there is also the Pacific Island population to consider and… a growing Asian population in the area.

At the same time, the school needs a lawyer on the board, preferably with expertise in industrial relations law. In a sense, this latter need is more pressing as the school has faced ongoing court actions over a number of cases. One board chair told us that every school should ideally have at least a lawyer and an accountant on it (he came from a 'rich' school!) In the absence of a Pacific Island, single parent, female lawyer with such experience, it is likely that 'business' will win out over 'community representation', assuming that this school can attract an appropriate person.

The 'market' ethos has thus cut across and undermined the 'community representation' goal in many schools. Although far fewer people stood for election to boards in 1992 than in 1989, those who did stand tended to be elected on the basis of their ability to run a business or provide a professional service. Many of the poorer schools in the study feel markedly disadvantaged, particularly in their dealings with the Ministry of Education, because their boards are perceived to lack business skills. This leaves these schools very vulnerable to a charge of mismanagement, particularly because it is the poorer schools that face funding difficulties.

Funding

The operational funding formula for schools is based on the philosophy of 'the level playing field'. Schools are funded, and staffed, primarily on the number of pupils they are able to attract. This system of funding makes the number of pupils attending a school crucially important to the financial health of the institution. Extra funding is available for a range of recognised disadvantages, such as remoteness, special needs, socio-economic factors and so on, but these extras are subject to strict criteria and are tightly targeted.

There is general support for the changed system, giving schools bulk operating funds, and allowing them to choose the services they see most need for. This system is more efficient at the school level and decisions on expenditure are made locally. It also prevents what one principal calls 'resource manipulation', with some schools favoured with resources denied to others. There is much anecdotal evidence that, under the old system, resources could be gained through 'old-boys' networks', and because of negotiating skills, rather than need. However, although this problem has largely been overcome (although lines of influence are still used – see later) the formula funding system has led to new difficulties for schools.

Rolls = Funds

The level of operational funding is entirely dependent on the numbers of students attending the school. The actual per capita amount of the operational funding has been frozen since the new system was put in place in 1990, which means that schools with a constant roll have experienced a real drop in spending power of around 10 percent over four years. Only those schools which have continued to increase their rolls have experienced an increase in funding levels, and this at the cost of an increased workload.

Parental choice has strongly affected school rolls, and, therefore, funds. The 'rich' schools in this study experienced an increase in the numbers of students attending, while the 'poor' schools have had a decrease in numbers. In some schools the results of this process have been alarming. One school, for example, experienced a 15 percent drop in funding in 1992 alone, and a further drop in 1993, because of falling rolls.

Funding declines as a result of a drop in the school roll — but expenditure in general does not decline at all. There may be savings on consumables such as toilet paper, but most expenditure within schools is not linked to per capita consumption. Curriculum resources, and therefore costs, for example, are related to the age, class level and/or subject being offered, and have to be maintained: to limit the range of courses offered is an almost certain way of compounding falling rolls. The cost of electricity, rates, maintenance and so forth is barely affected by a reduced school population.

So a decline in income is not offset by a decline in expenditure. If the roll falls some existing areas of expenditure have to be sacrificed, with inevitable effects on the programmes and resources offered by the school. The first thing to go is the funding schools are meant to put aside for long-term maintenance and capital works. A number of schools in this study have sacrificed most, if not all, of this funding. However, this can only be a short-term solution. Lack of funding in the future will lead to shabby buildings, inadequate grounds and fewer facilities for children. The sacrifice of long-term maintenance thus leads to a poverty trap.

> “...The new market model has quite deliberately... encouraged, even mandated, inequalities.”

At the same time, falling rolls mean a reduction in the number of staff. With fewer staff it would be helpful to offer programmes that would make up for more crowded classrooms, for example learning tasks centred on computer technology. Unfortunately, fewer resources means that the money is not available to provide such programmes. In other words, schools which are in this situation do not have the means to improve their position in the 'market'. One school in this study reached a point of crisis in late 1992, where, no matter how much they cut back, the budget deficit for 1993 was going to be $34,000, excluding depreciation. The school called in the Ministry of Education to assist them, arguing that the school was a special case and needed more resources. However, the assistance given was limited to re-organising the accounts of the school. Specifically, the funds allocated to various attached units at the school was to be used to subsidise the shortfall in funding within the main school. Not surprisingly, the staff at the attached units were unhappy at this 'solution'.

Community help

Schools gain income from the community. Income from parents is through two main sources: school fees and community activities (such as the school fair). There is a huge difference in the fees charged by schools. The range in this study was from $30 per pupil per year at the poorest primary school, to $100 per year at one intermediate school. This difference is compounded by the proportion of parents who actually pay the fees. At the intermediate school, for example, the $100 fee is paid by nearly 100 percent of parents. The primary school which charges $30 receives little more than a third of total fees. If each school had 200 pupils, the intermediate would receive $20,000 and the primary $2,500. In the 'poor' schools, fees are necessarily lower and the collection rate is also low. Yet, at the same time, the funding provided by the school fee is increasingly essential to the functioning of the school.

The second source of community income is fund-raising. Much of this is done by Parent/Teacher Associations, who play an increasingly important role in keeping many schools running. It is interesting to note that, in return for their work, many PTAs are now demanding a much larger say in how the money raised will be spent. Primary schools are particularly bound by the neighbourhood in which they are located. If it is a wealthy area, the annual school fair may (and does) raise $20,000. One of the poorer primary schools, with a specific goal in sight (the construction of a school hall), and with huge effort, was delighted that $4,000 had been raised in 1992.

Fee-paying pupils

There is also another potential source of income for some schools: full fee-paying overseas students. Some schools spend considerable time and money seeking fee-paying students. Part of the reason for this is the real drop in funding received even by 'rich' schools. For example, Christchurch Girls' High School, which is full and thus facing a static roll, raised the ire of many in the community when it suggested enroling a number of Asian fee-paying students, for the purpose of increasing its income. Hundreds of local students are turned away from this school each year so the reaction was not surprising. However, it misses the point. The logic of the market, and the exigencies of funding, require not a static roll but continual expansion. The funding received from fee-paying students, most of which is retained by the schools, provides the means for such future expansion. For example, at Christchurch Girls' High more fee-paying students would lead to more classrooms being built and thus more space being available at the school for local children.

A number of the schools in the study have enrolled full fee-paying students, although none through direct marketing to Asian countries. These children are mainly in the secondary schools, and evenly spread across 'rich' and 'poor' schools. Only one primary school, a 'rich' one, has such students. At this school, the number has dropped this year because most of the students have gained residency and no longer have to pay fees.

Staffing and funding

Although staff are paid by the Education Ministry (a scheme to give Boards of Trustees an 'average' bulk fund for paying teachers has been put 'on hold') staffing is closely related to funding. In order to gain extra staffing, two schemes from the NZ Employment Service are available to schools. One, Taskforce Green, requires the school to find a salary subsidy of $8,000 per year, to employ an unemployed teacher or other worker. The other scheme, Community Taskforce, allows a person to be employed in semi- or unskilled work; they receive the unemployment benefit plus $15 per week for three days' work. Schools in this study have made use of both these schemes, but only rich schools are able to take advantage of Taskforce Green because of the funding requirements. Two of the 'rich' schools have used Taskforce Green, while one 'poor' school depends heavily on Community Taskforce workers:

> ... who assist the school in various capacities including clerical work, maintaining resources, helping in the library and generally assisting classroom teachers and teachers in attached units.... Some trustees feel slightly uncomfortable about employing

unpaid workers, but all agree that their involvement is highly advantageous to the school. They perform tasks which the school could not employ paid workers to undertake, and the additional burden would fall on existing staff who are already being stretched.

Setting aside the ethical questions which the use of these workers raises (and which prevent many other schools from using these schemes), it is useful to compare these comments with those of the principal of one of the 'rich' schools that employed a Taskforce Green teacher. His main reason for doing so was to 'reduce the overall size of classes' which, he notes, is 'the most valuable thing that this board could do for the children'. These aims are admirable; but what will be the effects on future educational inequalities if only 'rich' schools have this choice?

Falling rolls are closely associated with community poverty. The funding gap is alarmingly large, and the ability of 'poor' schools to improve their status is minimal.

Management and marketing

All schools in the study, and the parents of children at the schools, appear to have 'taken-on-board' the view that schools should run as businesses; the work of boards of trustees is now seen as 'serious business'. This is a new vision of what schools are all about; its consequences need discussion.

> "...In some schools more than half the families exist on social welfare benefits."

'Rich' schools have increasing rolls; some are nearly full. 'Poor' schools are facing a continual decrease in their rolls, with the result that some face crises in staffing and funding. What do these two factors, combined, mean for the management of the school? The recent reforms are based heavily on the view that schools with falling rolls will be motivated to improve, and that good management 'makes the difference'. Boards of trustees are thus expected to act to improve the situation of the school.

All the schools in the study are very aware of the need for good management. Most schools look to the principal as the key 'manager' of the school. There is little doubt that principals are the main players, and set the management style for the whole school. Some are very hierarchical and exclusive; others work with networks and processes of inclusion.

However, the findings of this study contradict the claim that good management is all that schools need, and that strict devolution is in the interests of *all* schools. The problems which the 'poor' schools in this study are facing are a direct result of the processes of devolution and competition. Ball notes that the 'market' in education has been hopelessly idealised and refers to it as 'Adam Smith meets Mickey Mouse'. In real markets, businesses fail all the time, people go bankrupt and competitive industries become monopolies. There are mergers, takeovers and strategic withdrawals. What many schools are now experiencing is the cold wind of the 'real' market, and they are not equipped to deal with it. Neither is government policy nor the Ministry of Education.

A number of schools are thriving in this environment. The 'rich' primary schools in this study, in particular, are able to be innovative, to work closely with the local community, to budget for the future (although, like all schools, feeling the effects of no funding increase) and to improve processes of teaching and learning. Even these schools, however, do not have particularly good relations with the Ministry. However, their complaints about the Ministry differ substantively and significantly from those of the 'poor' schools. They tend to comment on the 'huge amount of bureaucratic paperwork', the lack of autonomy despite the rhetoric of *Tomorrow's Schools*, and the inefficiency of the Ministry. One school often makes direct submissions to Ministers and Members of Parliament, by-passing the Ministry. This school notes:

> ... the expertise and confidence of our board members and their familiarity with how the 'system' works gives them an unfair advantage over other schools.

The richest schools in this study do not use direct marketing strategies; they do not need to. Word of mouth and reputation are powerful tools, and these schools are now getting close to being full. One 'rich' primary school in this study became full whilst this research was being carried out, and was forced to shut out new enrolments from outside the school's neighbourhood. Up until then, pupils had been travelling from all over town to enter this school.

For the poorest schools the management situation is quite different, in particular their relationships with the Ministry. These schools experience the Ministry as an oppressive regulatory body, whose aims differ from those of the schools. The Ministry implements reductions in funding, frequent changes in regulations and makes demands on schools, 'often with no or little warning.' Cuts in the number of local liaison officers fuelled confusion, and gave the schools a feeling of vulnerability. Further, there is 'a large gap between where the Ministry wants to move to in the future and the money it provides for that process.'

The poorest schools in this study do not adopt specific marketing strategies. The two primary schools, in particular, have absolutely no resources available to undertake such strategies, and it is not clear on what basis they could compete with wealthier schools. Both rely on the local community to provide children. The poorest secondary school also feels it is not in a position to market itself. The principal pointed out that some of the best initiatives in the school related to Maori programmes, but these are generally kept quiet because they would drive away pakeha students.

Only two schools in this study are taking marketing seriously. These are the two 'average' high schools, both of whom are attempting to increase their rolls. In each school, a large amount of money has been allocated to advertising. The prospectuses are glossy, multi-coloured, attractive documents, backed up by strong recruitment drives in intermediate schools, use of the media for positive 'news' and a number of other 'high profile' strategies. In each case, improving their 'market share' involves increasing the number of middle-class children at the school.

Only one school, the area school, is attempting to market itself internationally to attract fee-paying students. This school was using its rural position to attract Japanese students.

The rich get richer and the poor get poorer

It is perhaps not surprising that the main finding of this research is that wealth and power go together. What determines the success of schools is a combination of cultural capital and economic capital. In this study, although a very small one, there is a very high relationship between the social make-up of the schools and their viability. This is a particularly disturbing finding. Not all schools can cater to the pakeha middle class. Not all schools can be run by lawyers and accountants.

A central claim of the 'self-management' literature is that good management makes effective schools. In countries such as New Zealand in which governments have uncritically embraced the 'devolution' model, this leaves schools that are not prospering open to the charge of poor management. The study has clearly shown that in those schools with major problems, the Ministry has not dealt with the actual difficulties they face but with difficulties the market theory says (without data) they must be facing. Much of the dissatisfaction schools feel with the Ministry (and the School Trustees' Association) is caused by the assumption these agencies make that the system is good but the people (the managers) need training, or more flexibility, or new lines of accountability, or more knowledge. Rarely, if ever, does the Ministry see a need for more resources. The Ministry, naturally, manages the system set up by its political masters. No Ministry should do otherwise.

This situation is exacerbated by the fact that those schools which are prospering tend to be those that have the lawyers, accountants and business people on the boards. Implicitly at least, this can be seen to reinforce the 'good management' assumptions that are now built into the education system. The alternative viewpoint is that schools with competent business people on the board are doing well because the neighbourhood in which the school is located is one in which such people choose to reside (and they, unlike others, do have such choices); and that this factor, the class mix of the area, is the major determinant of school success. In the official discourse of the level playing field, such explanations find no favour.

> ...Funding declines... but expenditure in general does not decline at all.

It would be too strong to say that good management has no effect on school performance. There has recently been an increasing number of reports from around the country of conflict between boards of trustees and principals and staff. Perhaps these schools are examples of poor management. Under these conditions, it is always likely that a school will suffer. But it does appear from this study that schools stuck at the rich or poor end of the spectrum have little room to manage their way to improve their 'market position'. Only those schools with a wide social class mix have the capacity to improve their market position significantly (and that appears to be what 'good management' means under current conditions). Girl's High appears to be an exception – a rich school making a decision to expand. However, this choice was shaped heavily by market logic and market conditions. And, of course their 'problems' are not solved by their actions, merely temporarily mitigated.

General Trends

The findings of this study show a marked tendency towards falling rolls in 'poor' schools, and rising rolls in 'rich' schools no matter how 'good' their management. Given the size of the sample, it seemed necessary to discover if this trend was more generally true. A follow-up study looked at the rolls of all Christchurch schools over a five year period. It found that a definite, but not universal, trend was apparent.

Those schools with the largest declining rolls (more than 20 percent) were all 'poor' schools. The four 'richest' schools have all experienced an increase in their roll. The study concludes that there is at least 'middle class flight', and probably 'white flight' too, in Christchurch schools.

This must lead to the conclusion that the new system of educational administration is leading our schooling system towards a major disaster. Some say it is already here. The findings of this study are crystal clear in one respect: that the direct linkage of roll numbers to school funding and school staffing prevents most schools with falling rolls from acting to improve their 'market position', because the factors that cause the decline in roll numbers are outside the control of the schools. It is, of course, no surprise that middle class schools are popular, or that parents and students will generally choose these schools when they have the opportunity to.

The lack of resources available to the 'poor' schools in this study is compounded by the effects of increasing social inequalities. These schools provide food, clothing (including uniforms), learning materials and other resources directly to students. Truancy is quite closely associated with working class, Maori and Pacific Island young people, who tend to attend 'poor' schools. There has been an increase in violent behaviour both within and outside many schools, and the phenomenon of school arson is also linked to lower socio-economic areas. All of these factors, taken singly, or more often together, place further burdens on schools which are increasingly financially impoverished.

Extra Funding and other help

During the 1993 election campaign, the Minister of Education made the point several times that $375 million per year is put into schools to enable them to deal with the effects of poverty. The various 'extra' funding categories are meant to compensate schools for being located in poor areas or for being otherwise disadvantaged. However, for the 'poor' schools in this study, the amount has declined and is nowhere near enough to allow them to compete: it is certainly not enough to make them viable competitors in the education market.

Support services (Maths Advisors, Physical Education Advisors, Art Advisors, Speech Therapists, the Psychological Service – now called Special Education Services) have also been cut back. In the section on management it was noted that the assistance available to schools is limited to a process of shifting available funding around, rather than providing any new resources. All the 'poor' and 'average' schools in this study desire more widespread and effective assistance from the Ministry; only the 'rich' schools, and not all of them, want less involvement by central agencies.

Conclusions

In four years of 'Tomorrow's Schools' the divisions between schools have widened dramatically. Most 'poor' schools in the study claim that, due to the dedication of teaching and administration staff, children's learning has not suffered at all. Other reports in the media are saying that it has; that, in the words of one principal, some schools are now more like social welfare institutions than places of learning. The answers to this problem lie mostly outside of the education sector, in social and administrative policies. But what is happening within education is simply reinforcing these external trends. Further, the distancing of the central state from the devolved schools places the responsibility in the hands of individual boards of trustees, who have no power to solve the problems they have inherited, or which have recently arrived.

Up until the reforms of 1989 there was an unstated goal 'Wherever you go to school, you will get a comparable education'. That goal was never achieved, but it provided a focus for teachers, administrators and academics. The new market model has quite deliberately rejected 'comparable' schooling in favour of a 'competitive' school. It has encouraged, even mandated, inequalities.

The limits of market competition are, however, bounded at both ends. As the Christchurch Girls' High example quoted above reminds us, those who constantly win soon reach the limits of conventional expansion. This is a problem for those schools because, in market terms, opportunities for 'profit' become increasingly limited. Little wonder then that these schools are looking to fee-paying students, or even mergers, takeovers and other market strategies, to further improve their position.

At the other end, many schools are now forced to compete but are structurally unable to win. Each year the problem is compounding, and no solutions are forthcoming. Only those schools 'in the middle' are able to take advantage of the market. The price they pay is high: often more than $10,000 per year on promoting the school and providing advertising material. The potential rewards are more students, more funds, more teachers, and possibly an increased proportion of middle class students. This last aim has its dangers: one school in the study lost $27,000 in equity funding because the proportion of eligible students dropped just below 50 percent.

The trends analysed in this paper were predicted from the time the reforms were implemented. Each problem is a direct response to the withdrawal of the state, the devolution of responsibility to schools, direct competition and parental 'choice'. However, the price has been high. Boards of Trustees will always – and quite properly – strive to make their schools as attractive as possible, but the temptation to enter into competition, by fair means or foul, for pupils from the most well-resourced families ought to be resisted. This sort of thing has always gone on – notoriously in certain areas – but it has not been a widespread, systematic, and self-conscious aspect of our educational system and it ought not to become such. There are issues of social morality as well as educational expediency at stake here. It is not difficult for those who control the market to make themselves better off – but there are others who must pay the cost.

The government might acknowledge more clearly that it has an important responsibility to maintain the broadly comprehensive character of New Zealand's educational system. The new system is unable to operate as intended. Although a small study the message is clear: major policy changes must be implemented soon, or the broad aim of equal educational opportunity will be further lost.

Notes

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The paper on which this *set* item is based was first presented to the New Zealand Association for Research on Education conference, November 1993, Waikato University.

The full study report is
Gordon, Liz (1993) *A Study of Boards of Trustees in Canterbury Schools*. Christchurch: Education Policy Research Unit.

Quotations not obviously from other works are from this report.

Tomorrow's Schools, the policy document on which NZ school administration reform was based is
Lange, David (1988) *Tomorrow's Schools*. Wellington: Government Printer.

Studies on aspects of the reforms can be found as follows

Focus
Codd, John and Gordon, Liz (1991) School charters: the contractualist state and education policy. *New Zealand Journal of Educational Studies*. Vol. 26, No. 1, pp. 21-34.

Intent
Gordon, Liz (1992) The state, devolution and educational reform. *New Zealand Journal of Education Policy*. Vol. 7, No. 2, pp. 187-203.

Ideology
Chubb, John and Moe, Terry (1990) *Politics, Markets and America's Schools*. Washington: The Brookings Institute

and
Gordon, Liz (1992) Educational reform in New Zealand: contesting the role of the teacher. *International Studies in Sociology of Education*. Vol. 2, No. 1, pp. 23-42.

Strategy
Lauder, Hugh (1992) Notes towards a new agenda for policy-making in Aotearoa/New Zealand. *New Zealand Annual Review of Education*. Vol. 1, pp. 1-14.

The British study of their reforms is
Ball, Stephan, Bowe, Richard and Gold, Anne (1992) *Reforming Education and Changing Schools*. London: Routledge.

There have been three surveys of the effects of the reforms on primary and intermediate schools which encouraged this study but are not mentioned in this item. They are
Wylie, Cathy (1990) *The Impact of Tomorrow's Schools in Primary Schools and Intermediates. 1989 Survey Report*. Wellington: NZCER.
Wylie, Cathy (1991) *The Impact of Tomorrow's Schools in Primary Schools and Intermediates. 1990 Survey Report*. Wellington: NZCER.
Wylie, Cathy (1992) *The Impact of Tomorrow's Schools in Primary Schools and Intermediates. 1991 Survey Report*. Wellington: NZCER.

The philosophy of the 'level playing field' is spelt out in
Kelsey, Jane (1993) *Rolling Back the State*. Wellington: Bridget Williams Books.

The increased workload that comes with the reforms is described in
Bridges, Susan (1992) *Working in Tomorrow's Schools: Effects on Primary School Teachers*. Christchurch: Education Department, University of Canterbury.

A school principal's perspective on school fees can be found in
Gordon, Liz (1993) Competing pressures: market reforms in New Zealand. *Principal Matters*. Vol. 5, No. 1, pp. 12-14.

The way PTAs are asking for more say in how the money they raise is spent is outlined in the full study report pp. 37-38.

The controversy over Christchurch Girls High School's policy on fee-paying students is instanced by
Espiner, Colin (1993) *Anger at Fee-paying Student Scheme*. The Press, 24 August, p. 1.

That good management 'makes the difference' is exemplified in the following, though it should be noted that these authors consider devolved self-management to be good management by definition.
Chubb, John and Moe, Terry (1990) *Politics, Markets and America's Schools*. Washington: The Brookings Institute.

Ball's comment, 'Adam Smith meets Mickey Mouse', is from the British study mentioned above.

The follow-up study of all Christchurch schools' roll statistics is
Ainsworth, Valerie et al. (1993) *Tomorrow's Schools and Freedom of Choice – A Recipe for Disaster*. Christchurch: Education Policy Research Unit.

A study of how parents choose schools in New Zealand is
Nash, Roy (1993) *Succeeding Generations*. Auckland: Oxford University Press.

A New Zealand study of truancy is
Gordon, Liz (1993) The politics of truancy in 1992. *New Zealand Annual Review of Education*. Vol. 2, pp. 285-302.

That Boards of Trustees will always – and quite properly – strive to make their schools as attractive as possible, was pointed out by Roy Nash. He also called upon the government to acknowledge more clearly its responsibility to maintain a broadly comprehensive secondary education system.

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item 6

set
number two 1994

Prior Knowledge

and How it Influences Classroom Learning.

What does the Research tell us?

Gregory Yates and *Margaret Chandler*

A REVIEW OF THE MANY research projects on how prior knowledge effects learning. Generally, having old knowledge, to which new knowledge may be attached, greatly assists learning the new.

WHY DO SOME CHILDREN learn quickly, with little apparent effort or pain? Why do some students need far less instruction or inducement to learn than is required to motivate others? Traditional answers often refer to intelligence, learning style or personality, or perhaps allude vaguely to factors such as home background and achievement needs. Our reading in the research literature of **cognitive psychology** has convinced us that **knowledge theory** arrives at a very powerful and unifying basic idea. We can state, or perhaps overstate, this idea in the following blunt manner:

> **Prior knowledge is the major determinant of capability, capacity, disposition, and facility in children's classroom learning**.

This simple, almost 'obvious', notion turns out to have remarkable implications bringing new insights on intelligence, mental strategies, problem solving, individual differences, instructional effectiveness, and teacher-student interactions.

Research Findings

Research into automatic and controlled mental processes

Mental processes can be either automatic or controlled. A fundamental finding of modern cognitive psychology is that complex human functioning hinges upon developing **automatic** elementary information processing skills. Whenever we pick up a book to read, or drive a car up the road, or begin writing sentences on paper or a word processor, or even make a pot of tea, we rely totally upon the automatic way we do sets of previously acquired subskills. Allowing some behavioural processes to become automatic enables other processes to become consciously controlled, that is, to occupy mental 'centre stage'.

Automatic processing involves minimal effort, virtually no attention, and needs no practice. Such processes cannot be unlearned and are not subject to normal voluntary control. For example, it is no trouble to ride a bicycle 20 years after the last time, and it is almost impossible to hear the phrase 2 + 2 without thinking = 4. Indeed, to draw attention deliberately to the automated functioning reduces performance. For example, to focus deliberately on individual letters in reading, as a proof-reader does, considerably reduces reading speed and comprehension.

Controlled information processing, on the other hand, entails large amounts of conscious attention and effort. For example, when we approach any new situation or task we have to focus carefully, identify crucial cues, assign priorities, and decide on how to respond. However, as we gain experience through active practice we learn various mental short-cuts and far less attention is required. With extended practice, we build up skill and the task becomes relatively effortless, more automatic, and perhaps more enjoyable.

But the amount of practice required to achieve automaticity may be considerable. Unfortunately the time needed is often underestimated or unacknowledged in teaching and learning. One researcher says 'It requires at least 100 hours of learning and practice to acquire any significant cognitive skill to a reasonable degree of proficiency.' Automated functioning may require thousands of practice trials, for example, it is estimated that achieving total automatic word recognition requires somewhere around 10,000 exposures to individual words.

A good deal of early education in language, reading and mathematics is aimed at making the child's mental operations more automatic, less effortful and more enjoyable. It is known, for example, that practice in computation and estimation skills facilitates the development of mathematical reasoning. Research with Asian children has established that high levels of practice on the abacus are associated with both enhanced short-term memory for numbers, and with improved skills in mental arithmetic. It has been repeatedly documented that failure to develop automatic decoding is one of the central characteristics of many poor readers who are thus forced to devote an inordinate level of effort to deciphering print.

Research into learning processes

Existing knowledge has a powerful influence upon a person's ability to learn new material. Learning occurs considerably more rapidly, efficiently and meaningfully if a new input can be related to existing knowledge. Some of the research illustrating this point is particularly interesting. For example in different research projects, (a) American college students remembered more from reading about the British game of cricket once the relationship of cricket to baseball was made explicit; (b) adult soccer enthusiasts were able to recall random numbers presented in the form of game scores more effectively than could non-enthusiasts; (c) young children's prior knowledge of toys strongly predicted their scores on a comprehension and recall test following exposure to a short narrative involving these toys; and (d) high school students were able to assimilate and recall the details of algebraic story problems far more readily when those problems conformed to the specific story types with which they were familiar.

Although possessing relevant knowledge will often make a person more interested in particular types of information, the impact of knowledge on learning cannot be attributed simply to enhanced interest or to paying more attention, since these motivational factors were often carefully controlled within the research designs. Although interests, incentive, and motivation all clearly influence learning, prior knowledge has been shown to have strong effects even after accounting for these variables.

Learning has to be seen as a highly cumulative process. The more one knows, the more likely one is to profit from related experience or instruction. But what processes are involved? We now appreciate that the learner with salient prior knowledge is able to employ highly effective acquisition strategies such as organisation, chunking and elaboration, and so becomes able to assimilate relatively high levels of information input without suffering overload effects. Knowledgeable learners can process more information, at a deeper mental processing level, and can do so in less time. For example, in one study it was shown that existing knowledge enabled readers to mentally integrate sentences and paragraphs and so comprehend higher level themes (i.e., the 'big picture') quickly.

Plainly, being able to access relevant knowledge reduces the 'cognitive strain' that a learner needs to process incoming information. In addition, knowledge is likely to have emotional payoffs, perhaps through helping a learner to achieve confidence, autonomy, purpose, and self-direction. Within the classroom, prior knowledge helps a student become less dependent upon instruction, more familiar with the 'big picture', more able to cope with independent assignments, and more able to assess his or her own progress.

Research into schemas and their acquisition

Cognitive psychologists have found it useful to picture knowledge in the mind as sets of organised and interlinked mental **schemas.** You might think of schemas as organised groups of concepts. As we experience the world, we invariably attempt to relate our experiences to the schemas we already have. For example, to read *'Lorraine sat down and stared at the menu'* instructs the brain to activate its schema concerning restaurants. Once activated, the schema becomes the basis for comprehension, expectation, inference, and learning. Some theorists suggest that once schemas are activated certain 'slots' are opened and the mind is primed to receive certain types of information. For example, our reader is now expecting Lorraine's behaviour to be consistent with ordering and eating a meal, and having to pay for it.

In one fascinating experiment students were asked to listen to fourteen statements, one of which was, *'First, you arrange the items into different groups. Of course, one pile may be sufficient depending on how much there is to do'.* The students found it difficult to recall this information and they rated the whole passage as relatively incomprehensible. However, a second group of students were informed in advance that the statements were concerned with washing clothes. A *washing schema* was activated and these students recalled a good deal of the information and found the experience comprehensible. Getting the washing cue *after* hearing the passage failed to have any effect. In order to understand and learn effectively, it is of considerable value to be equipped with relevant schemas, and to have this knowledge activated at the very moment when learning is to take place.

This point helps to explain why **repetition** is often so important (but often overlooked) in meaningful learning. You may need to come across information perhaps two, three, or more times before the essential schema is 'in place'. For example, research into how people read complex text reveals that **repeated readings** allow the reader (a) to refocus attention onto relevant rather than peripheral details, (b) to reorganise ideas and make connections with what is already known, and (c) to reword the essential information in the reader's own language rather than to regurgitate the exact words given in the text. A number of studies now indicate that when people, even 'well-educated' ones, are asked to read text containing rich levels of information, they are usually unaware that a single reading is insufficient for genuine understanding. A Canadian study found that university students grossly over-estimated how well they could answer comprehension questions after a single reading.

Acquiring and using schemas. Studies with upper primary school children have found that academically successful students are highly adept in using their own schemas when attempting to learn new information. These students used their existing conceptual knowledge to generate precise elaborations. But the less successful students, even though they did not lack appropriate conceptual knowledge, were generally unaware that using it would help them to learn. They did not appreciate how new information can become far more meaningful when consciously related to what is already known. The good news is that these students responded well to cognitive training sessions. These sessions were in the techniques of deliberately generating meaningful elaborations.

Think of schemas as higher level organising concepts which can actually be acquired (or substantially refined) through direct teaching and instruction. For example, it has been found that within geography lessons, students can be taught a *nation* schema which aids them in reading about different countries, that primary students can be easily taught basic principles of *expository discourse*, and that language arts students can be taught an effective *story* schema for comprehending narrative sequences. In one study with university science undergraduates significant improvements in reading, understanding, and recalling difficult scientific papers were found after the students had assimilated an eight-page written summary of the principles of *journal article construction*. Findings such as these indicate how important it is for teachers to point out explicitly the organised (and schematic) nature of knowledge, particularly the way knowledge is recorded and used within specific disciplines.

Can schemas be acquired from abstract language? One specific finding is of particular relevance to teachers. The human mind cannot genuinely assimilate relatively new verbal information in the form of abstract dictionary-type statements. It is perhaps impossible for the mind to understand higher level principles, abstractions, or definitions, without being shown how to relate the abstract statement to specific positive examples, instances or actual cases. The use of a good range of concrete examples is absolutely critical. Attempting to learn complex verbal propositions in the absence of examples might at best produce superficial learning (what cognitive psychologists refer to as **inert knowledge**). As teachers we should note that schema formation is enhanced dramatically when learners are prompted to consider a range of positive cases and examples that vary widely on *irrelevant* attributes. Only in this way can the mind begin to identify deeper conceptual properties. As a direct example of the power of this effect you might like to repeat the minor experiment we tried out on our colleagues as described in Appendix A.

Mental models, analogies, and metaphors

As learners encounter complex materials (such as in science, mechanics, higher mathematics, statistics and computing) they will benefit considerably from any information enabling them to construct **mental models** of the complex subject matter. A mental model consists of schemata, but in addition includes information about how crucial elements interact or operate together as a system. For example, it is absolutely crucial for your survival that your car mechanic possesses a sophisticated mental model of hydraulic braking systems. Models play an essential role in helping a learner appraise the importance of different items of information, and in deciding which information to focus upon, and which to ignore.

It is now known that in any complex learning the human mind naturally, and almost inevitably, latches on to any information source which enables 'runnable' models to be constructed. Excellent teachers may capitalise on this trait by doing things such as providing overviews, using advance organisers, using visual displays, spending time analysing flow diagrams, or by the careful use of analogies and metaphors.

Well chosen **metaphors** and **analogies** can be highly effective learning devices. The heart might be described as a pump, the living cell as a factory, cancer as a slow explosion, an ant colony as a single organism, a computer screen as a window, and so on. Obviously such metaphors have limitations. However, at the outset of learning, they can help a learner construct an elementary model of a complex event or process. In this fashion, knowledge acquired earlier in one domain may, **if appropriately activated,** assist in effective learning in a different domain. Indeed the most effective analogies are ones that link together two remarkably *different*, rather than closely related, phenomena. For example, one group of researchers found that students' understanding of the concept of *statistical mean* was enhanced when a *balance beam* was used by way of analogy.

A good deal of research has found that children think naturally using metaphors and analogies. For example, beginning readers will naturally relate unfamiliar words to words they do know. In one remarkable study children as young as two years were able to reason via analogy, provided they were given highly specific guidance as to how to employ their earlier experiences in a new context.

However, laboratory studies with older children and adults have shown that although individuals may appear on the surface to readily understand simple analogies, they have remarkable difficulties in actually using 'obvious' analogies in new problem solving contexts. It appears that analogies are things we easily 'see', but only after having the 'obvious' relationships pointed out to us. To put this another way, the success of analogies depends directly on the nature of the instruction, prompts and hints given to the learner. We cannot stress this point too strongly: It is not sufficient for a teacher to simply mention an analogy, for example, *You can think of the heart as a pump*. The specific analogous relationships need to be made explicit and openly discussed for knowledge transfer to take place. Excellent teachers naturally develop a repertoire of salient analogies and the research clearly validates this practice.

Research in problem solving

In recent years, two major theories of problem solving have received support in cognitive research. The **mental skills** approach suggests various strategic ways in which individuals can learn to improve thinking and problem solving, such as eliminating distractions, focusing attention, experimenting with different ways of formulating a problem, monitoring goals, generating alternatives, and testing these in some logical manner. The educational value of this advice has been documented in numerous ways with both normal and 'at-risk' children. The notion that children and adults can learn to apply generalised cognitive and metacognitive strategies is now widely accepted.

The **knowledge theory** approach has, however, in recent years documented an interesting phenomenon: the more expert people become at solving problems (within a given domain) the *less* they use general problem-solving skills. Expert problem solvers simply do not behave as the mental skills approach recommends they should. Instead, they have learned to use their extensive knowledge base about a given topic to interpret new problems automatically as reformulations of old ones. This phenomenon was initially studied in superior chess players, but has now been observed in computing, physics, economics, electronics, music, medical diagnosis, and classroom teaching.

Generalised thinking and problem-solving skills are of value when encountering an unfamiliar topic. However, as people become more skilful (i.e., expert-like) their thinking becomes more closely attuned to the constraints of the problems to be solved, and especially to the need to generate *successful* solutions. Non-productive divergence can be tolerated only at the outset and a point is reached where the use of general strategies becomes wasteful and counterproductive. Thus, the skilful problem solver (within a given domain) rapidly moves away from applying generalised mental stratagems and develops domain-specific pattern-recognition skills. These critical encoding skills enable stored knowledge to be brought to bear rapidly on new problems and thus enable quality solutions to be reached.

Although experts engage in very fast encoding and understanding processes as they encounter problems, they do not always try to solve problems very quickly. Experts, in contrast to novices, tend to be highly sensitive to the level of difficulty of any given problem. Thus they spend *more* time examining the problem, and will resist arriving at impulsive, facile conclusions. They readily discriminate problems they can solve easily from those that demand more time, attention, or further information. The expert's knowledge base is used to great advantage in forming these metacognitive discriminations.

Research in child development and the emergence of literacy skills

A significant body of developmental research now clearly indicates that a large number of age-related changes are directly attributable to growth in the knowledge base. These changes are in perspective taking, grouping and classification skills, depth (elaboration) in encoding, memory strategies, operational intelligence, problem solving, verbal facility, inferential processing, and writing facility. Recent studies in how children acquire scientific concepts in biology and astronomy indicate that their reasoning within these areas is more closely constrained by their available knowledge than by their age level or IQ.

In essence, a good deal of the many natural differences we detect in the thinking processes of younger and older children turn out to relate directly to the fact that older children know more. When age differences in learning do emerge, they are often the natural consequences of developments in the knowledge base. When we ask children to perform tasks that do not rely on activating prior knowledge then age differences are typically not there. It is now apparent that earlier research in developmental psychology completely overlooked the importance of the knowledge base in information processing and thinking.

Research in reading and literacy skills has often found evidence for prior knowledge effects. For example, (a) phonological (i.e., sound/symbol) knowledge in preschoolers will predict the subsequent achievement of basic reading skills; (b) word knowledge and decoding measures typically predict reading comprehension abilities; (c) the understanding of devices such as metaphor and simile has been shown to depend upon relevant vocabulary knowledge; and (d) children write more and with far greater goal-orientation, coherence, and enjoyment when asked to write upon topics about which they possess relevant background knowledge. Several studies now indicate that children's comprehension and accurate recall of specific reading material can be more strongly predicted from measures of prior knowledge than from standardised test measures of generalised reading ability.

Discussion: Key Issues in Applying Knowledge Theory

Knowledge and Intelligence

Up until quite recently, psychologists often believed that intelligence could and should be assessed using 'knowledge free' instruments. Intelligence tests were meant originally to measure the capacity of the mental muscle itself, whereas achievement tests would indicate the extent to which this capacity manifested itself in literacy and numeracy. But in actual practice, the distinction between intelligence and achievement never became clear. In the verbal and mathematical domains in particular, it became impossible to say whether an item was measuring achievement or intelligence. This facet was well known to a number of researchers right back in the 1920s. It just took us a while to appreciate its significance.

Modern cognitive theory helps to completely redefine the concept of intelligence. We now appreciate that people behave intelligently ***because*** of the knowledge they possess. The intelligent mind is one with a potentially rich supply of pre-existing knowledge. Within relevant contexts, knowledge can be activated quickly to bear upon new experiences, to promote mental understanding and elaboration, to identify and make sense out of strange patterns, to recognise familiar elements, and to suggest viable response options. Hence knowledge is seen as the major factor that enables people to function and appear as intelligent, even on carefully prepared standardised tests. This view, that possessing knowledge enables you to become intelligent, contrasts markedly from earlier psychometric views.

It is easily overlooked that the IQ-type tests in common usage are largely measures of achievement and existing knowledge within restricted domains. Hence it is not surprising to find that short forms of IQ tests retain the vocabulary and general knowledge items. In fact, IQ tests do a poor job of predicting performance on tasks upon which prior knowledge is unlikely to differentiate individuals, for example, learning arbitrary associations, and doing laboratory tasks. Furthermore, IQ data are unrelated to complex mental performances where individuals have developed considerable expertise or where successful thinking depends on familiar routines and stored knowledge built up over years. This point was illustrated dramatically in Ceci and Liker's study reported in 'A Day at the Races' in ***set*** No. 1, item 11, 1994. Racegoers with IQs in the 80s were using mental models of amazing complexity to (accurately) pick horses and odds and the researchers say, 'whatever it is that an IQ test measures, it is not the ability to engage in complex forms of multi-variate reasoning.'

Ceci and Liker's data are certainly not unique: there are many recorded examples of genuinely intelligent behaviour on the part of individuals who have difficulty on IQ-type measures. In real-life relevant knowledge, experience, and repeated practice will readily outweigh global factors such as IQ. However, in school contexts a child's IQ score represents an approximation of his or her general knowledge level, at least for certain academic topics.

Are prior knowledge effects obvious?

The idea that learning is influenced by what a person already knows is perhaps initially unsurprising. But what is surprising is the power and subtlety of this effect. Once a learner's attention is secured, the impact of existing knowledge on learning is likely to outweigh factors such as incentive, cognitive style, locus of control, personality or disposition. The research has now established that prior knowledge constitutes a highly salient factor explaining why some students learn more from the same experience than others, even once variables such as IQ and socio-economic status are controlled.

The impact of prior knowledge on mental processing whilst learning, at the moment of acquisition, is *not* obvious. The deeper processing that knowledge permits is essentially hidden from a teacher's view.

Prior knowledge allows a learner to imbue an experience with greater meaning, resulting in higher levels of inferential processing and a greater ability to attend to the crucial elements of the experience. In a classroom study, Ellen Gagne and her colleagues found that children who knew more about a topic to begin with, remembered more of the lesson a month later, relative to their low-knowledge classmates. This effect was apparent even though the low-knowledge students had initially been allowed more time to study the material to bring them to mastery level.

Prior knowledge effects can be subtle and totally unobvious. As adults we rate a task as 'easy' or 'difficult' largely because we are familiar or unfamiliar with the actual elements of that task; we are reporting how automatic the task is, rather than other more objective features. As a consequence we have almost no insight into the difficulty level of acquiring basic skills — which we expect of our children in the early school years. We fail to appreciate that achieving 'simple' skills such as counting and one-to-one correspondence involves mastering a complex sequence of knowledge elements and production skills. Further, as adults we are unlikely to appreciate how our ability to acquire new knowledge relates directly to pieces of prior knowledge acquired years, even decades, earlier.

Is knowledge a threshold factor?

How much knowledge do we need? Can getting knowledge be self-defeating? Can we have too much 'up there', undermining mental efficiency? Does knowing too much make you incapable of making decisions? Well, there is no serious evidence to suggest that learning too much can 'clog' your mind. Whereas short-term memory can be rapidly overloaded, long-term memory does not appear to possess limits. Knowledge forces you to recognise complexities, perhaps forcing you to think more carefully rather than act in a blind or impulsive manner. But reflectiveness (in contrast to impulsiveness) is a trait more likely to be associated with increased, rather than decreased, mental efficiency.

The human mind simply does not, and *probably cannot*, acquire new facts, propositions or vocabulary items ad nauseam. A knowledgeable person not only knows a large number of concepts and facts but also knows highly effective ways of accessing, organising, classifying, rearranging, and comparing these elements. The research into expertise clearly supports the view that enhanced mental processing is associated with the accumulation of an extensive knowledge base.

Three conditions where existing knowledge can inhibit new learning

Memory interference has been researched extensively. Information already in the head may become confused or interfere with a new experience. However, this interference is generally weak where the context is meaningful. Several studies have even demonstrated that possessing and using a strong prior knowledge base (rendering things more meaningful) is a very effective defence against interference effects. In other words, a little or insecure knowledge certainly may become a source of interference, but the more one knows about a new input, the less it will suffer memory distortion, interference or loss. 'A little learning is a dangerous thing. Drink deep...'

Misconception effects are a subtle but especially interesting phenomenon. When a learner approaches a new topic but already has faulty beliefs or knowledge based on misinformation, any new information is likely to be interpreted in terms of the initial misconception. Faulty prior beliefs can be highly resistant to change. Along with other natural biases, faulty knowledge appears to be particularly strong when we are asked to learn or to make decisions about relatively unfamiliar events. Classroom research has indicated that if students possess misconceptions which are not specifically attacked within the instructional process, then the original notions persist, with students being unaware of the discrepancies between their existing ideas and the content of instruction.

Misconception effects have been reported in many curriculum areas including mathematics, science, English, social studies, and geography. Obviously many misconceptions stem from everyday life, but can arise from poor teaching, particularly from unclear presentations and ill-defined concept boundaries. Teachers need to be aware of likely misconceptions in their subject. Once diagnosed, misconceptions should be exposed and directly tackled. Research provides no basis for believing that faulty assumptions or beliefs ever correct themselves. Sensitive but firm help is essential to get the learner back on the right path.

Know-it-all effects have been found in research in reading. At times readers may fail to really engage with text in the belief they 'know it' already. We possess a natural tendency to over-estimate what we really know, at least prior to receiving more objective feedback. All teachers will be familiar with the experience of having students protest their low grades with pleas such as, *I thought I knew it* or, *But I did read everything*. Skimming is an essential strategy but the reader should recognise that comprehension during skimming may be of existing knowledge rather than of new information from the text.

The Matthew effect

One particular advantage for someone who possesses knowledge is the ability to use that knowledge to bootstrap subsequent learning. This cumulative impact of knowledge is one example of the Matthew effect (that is, *the rich get richer*). In the natural world (in contrast to the constructed world of psychometric testing), many psychological attributes, abilities and achievements follow a positively skewed statistical distribution. Rather than the popular (but often misleading) normal curve, actual achievement scores at the top of distributions tend to be higher than expected. These positive skews are because some people readily use their existing knowledge and skills to become even more knowledgeable and skilful.

A large body of research, summarised by Keith Stanovich, suggests that the other side of the Matthew effect (*the poor get poorer*) is clearly implicated in the phenomenon of reading failure in children. In our society children are expected to comprehend the alphabetic principle in the first year of school. Those with markedly underdeveloped phonological knowledge (for whatever reason) have considerable difficulty and lag behind their peers in developing rapid visual word recognition. Therefore, they receive much less practice in reading than others. Low levels of reading then inhibit development in aspects such as vocabulary, complex syntax, general knowledge, and intelligence.

The specific problem (lack of phonological knowledge) is thereby linked to more generalised effects such as lack of enjoyment, experiences of failure, and feelings of helplessness. Being relatively cut off from the benefits of print, the poor reader fails to build the rich, elaborated, and redundant cognitive network, the knowledge base, of the good reader. As Tom Nicholson (mis)quoting Saint Matthew put it, 'From those who cannot read much is taken away'.

Knowledge construction as a central goal of education: the building and digging analogies

Contemporary cognitive theories of learning see the development of knowledge as a process of **active construction**. Information cannot be received directly into the mind as packaged bundles of verbal statements, nor as fresh traces upon a tabula rasa, nor as direct copies of experiences. Learning involves each one of us busily making sense out of experiences. This we do primarily by (a) relating new experiences to what we already know, but also by (b) perceiving connections and relationships, or (c) by thorough analyses of linked case study examples of specific events or phenomena. On some occasions we will differ in our interpretation of the same experience and these interpretations may diverge radically from the intentions of our teachers. For example, we heard recently of a group of high school students, believers in creation science, who decided that the fossil record must be God's way of testing their faith.

Within recent years these notions of cognitive learning and 'sense-making' have been referred to generally as **constructionism** although there are many different shades of opinion within this contemporary movement. A constructionist viewpoint casts the classroom teacher's role as one initiating and guiding conceptual change in students' thinking and encoding.

The building and construction analogy of cognition can be taken even further: effective teaching entails **instructional scaffolding.** Scaffolding can be directive cues, prompts, modelling, vocabulary development, clarification, analogies, worked examples, responsive assistance, accurate feedback, for example. We stressed the need for varied examples in teaching unfamiliar concepts; this is scaffolding. Scaffolding involves both directive and non-directive activities, the central point being that the teacher provides coaching to a point at which students are more able to regulate their own learning. In this sense, scaffolds are temporary structures to be removed as knowledge and skill increase.

Finally, an important and recurring research finding should be noted: having access to declarative knowledge (to propositions lodged within long term memory) is not the same as being able to use this knowledge.

In encouraging students to use their knowledge productively, teachers need to present a model of thoughtfulness and reflection. Good instruction must involve helping learners to really **dig** into their minds to discern when, where, and how existing mental elements can bear upon new demands. Knowledge inertness is failure to activate potentially available knowledge in the service of problem solving. Ideally, **knowledge is a tool** to be used in the service of whatever goals are currently important. A good search around in the mental backyard might uncover some little-used tools.

Appendix A

Making Text Incomprehensible

We asked several of our colleagues to read the following

> *The Matthew effect refers to increased variance within indices of individual differences attributable to active and evocative organism-environmental interactions in which differentially advantaged organisms are exposed to nonrandom distributions of environmental quality.*

The rich and insightful feedback we received included 'A load of b........', 'I hate academics', 'What tool wrote this?', and 'Not bad syntax, I knew all the words, but what's it about?'. We had one vaguely positive response: 'I already knew about Matthew, so I think I understood it, ... but don't ask me to repeat it.'

Of course we were the tools that wrote the sentence. And in that sentence the level of text difficulty could be increased! For example, you could use 'augmented' instead of 'increased', and so on. Some of our colleagues are highly educated people so why is this sentence such a useless vehicle for conceptual learning? Our goal was to illustrate the point that abstract definitions and principles are meaningless verbiage unless learnt in association with examples, illustrations, or cases. We then asked our friends to read the following, each sentence containing examples of Matthew effects.

> *(a) Children who read well tend to read more, they increase their vocabularies, and their general knowledge. In essence, good readers become even better readers, so that the gap between good and poor actually increases as time goes on. It is a* Matthew *effect.*
>
> *(b) Growing up in a household where there is a good deal of verbal interaction and reasoning puts the child in a good position for learning in school-like environments. They can really use this early advantage.*
>
> *(c) It was evident that the untrained teachers spent most of the time encouraging the students who had shown an initial high interest in doing science projects. These students, but not the others, showed marked increases in their positive attitudes to science and in expressing the desire to study science at the tertiary level.*
>
> *(d) 'I thought I gave a really good lesson on setting up a data base. But apparently the only ones who understood me were those who already knew tons about DOS files. The rest tried hard, but I only reached the ones who knew their way around a PC.'*

After reading these four examples our colleagues again provided feedback but this time of a very different nature.

Notes

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This **set** item is in part derived from their paper, 'The Cognitive Psychology of Knowledge : Basic Research Findings and Educational Implications', first published in *The Australian Journal of Education*, Vol. 35, No. 2, 1991, pp. 131-153.

Declarative and Procedural Knowledge

The relevant learning conditions for the two types of knowledge differ considerably, and are discussed in depth in

Gagne, E.D., Yekovich, C.W., and Yekovich, F.R (1993) *The cognitive psychology of school learning, 2nd edition.*. Boston: Little Brown.

Talking to oneself (self-instruction) in high achieving children has been documented by Canadian researchers, see

Biemiller, A. (1993) Lake Wobegon revisited: on diversity and education, *Educational Researcher*, Vol.22, No.9, pp 7-12.

Research into automatic and controlled mental processes

Automaticity and its emergence is reviewed in Gagne et al. (see above) who draw heavily on the research and theory of Anderson. The direct quotation about the volume of necessary practice is

Anderson, J.R. (1982) Acquisition of cognitive skill, *Psychological Review*, Vol. 89, pp. 369-406.

That time with phonic decoding helps comprehension is in

Samuels, S.J. (1983) A cognitive approach to factors influencing reading comprehension, *Journal of Educational Research*, Vol. 76, pp. 261-266.

That the abacus helps mental arithmetic is in

Hatano, G. and Osawa, K. (1983) Digit memory of grand experts in abacus-derived mental calculation, *Cognition*, Vol. 15, pp. 95-110.

That disabled readers devote inordinate effort to decoding is in

Stanovich, K.E. (1986) Matthew effects in reading: some consequences of individual differences in the acquisition of literacy, *Reading Research Quarterly*, Vol. 21, pp. 360-406.

Research into Learning Process

The baseball/cricket example is from

Hayes, D.A. and Tierney, R.J. (1982) Developing readers' knowledge through analogy, *Reading Research Quarterly* , Vol. 17, pp. 256-280.

The soccer example is from

Morris, P.E., Gruneberg, M.M., Sykes, R.W. and Merrick, A. (1981) Football knowledge and the acquisition of new results, *British Journal of Psychology*, Vol. 72, pp. 479-483.

The toys example is from

Hare, V.C. and Devine, D.A. (1983) Topical knowledge and topical interest predictors of listening comprehension, *Journal of Educational Research*, Vol. 76, pp. 157-160.

The algebra stories example is from

Mayer, R.E. (1982) Memory for algebra story problems, *Journal of Educational Psychology*, Vol. 74, pp. 189-216.

That prior knowledge and interests are independent effects is from

Baldwin, R.S., Peleg-Bruckner, P. and McClintock, A.H. (1985) Effects of topic interest and prior knowledge on reading comprehension, *Reading Research Quarterly*, Vol. 20, pp. 497-504.

The use of organisation, chunking, and elaboration are explained in

Ornstein, P.A. and Naus, M.J. (1985) Effects of the knowledge base on children's memory strategies, *Advances in Child Development and Behavior*, Vol. 19, pp. 113-148.

Knowledgeable learners do not suffer memory overload: see

Charness, N. (1976) Memory for chess positions: resistance to interference, *Journal of Experimental Psychology: Human Learning and Memory*, Vol. 2, pp. 641-653.

They process information at a deeper level, in less time: see

Gagne, E.D., Bell, M.S., Yarbrough, D.B. and Weidemann, C. (1985) Does familiarity have an effect on recall independent of its effects on original learning? *Journal of Educational Research*, Vol. 79, pp. 41-45.

Existing knowledge enables readers to integrate sentence and paragraphs quickly to construct higher level models (the big picture effect): see

Fincher-Kiefer, R., Post, T.A., Greene, T.R. and Voss, J.F. (1988) On the role of prior knowledge and task demands in the processing of text, *Journal of Memory and Language*, Vol. 27, pp. 416-428.

Prior knowledge makes students less dependent (for success) on instruction: see

Anderson, L.M. (1985) What are students doing when they do all that seatwork? In C.W. Fisher and D.C. Berliner (Eds.), *Perspectives on Instructional Time*, pp. 189-215. New York: Longman

and

Nicholson, T. (1984) Experts and novices: a study of reading in the high school classroom. *Reading Research Quarterly*, Vol. 19, pp. 436-451.

Research into schemas and their acquisition

An excellent reading on schema theory with a particular emphasis to the stages of development involved in learning new schemas is

Shuell, T.J. (1990) Phases of meaningful learning. *Review of Educational Research*, Vol.60, pp.531-547.

The notable experiment on advance organising information is

Bransford, J.D. and Johnson, M.K. (1972) Contextual prerequisites for understanding: Some investigations of comprehension and recall. *Journal of Verbal Learning and Verbal Behavior*, Vol. 11, pp. 717-726.

The dramatic effects of repetition on meaningful learning are documented by

Mayer, R. E. (1983) Can you repeat that? Qualitative effects of repetition and advance organizers on learning from science prose. *Journal of Educational Psychology*, Vol.75, pp.40-49.

The Canadian study on how tertiary students under-estimated their ability to understand complex prose from a single reading is

Pressley, M and others (1990) Sometimes adults miss the main ideas and do not realize it: Confidence in responses to short-answer and multiple-choice comprehension questions. *Reading Research Quarterly*, Vol.25, pp.233-249.

Studies with upper primary and older children using schemata as learning strategies include

Stein, B.S., Bransford, J.D., Franks, J.J., Owings, R.A., Vye, N.J. and McGraw, W. (1982) Differences in the precision of self-generated elaborations. *Journal of Experimental Psychology: General*, Vol. 111, pp. 399-405.

and

Gagne, E.D., Weidemann, C., Bell, M.S. and Anders, T.D. (1984) Training thirteen-year-olds to elaborate while studying text. *Human Learning*, Vol. 3, pp. 281-294.

Direct teaching of schemata to geography students is described in

Ohlhausen, M.M. and Roller, C.M. (1986) Teaching students to use a nation schema to learn about countries. *Journal of Reading*, Vol. 30, pp. 212-217.

Direct teaching of schemata to language arts students, is described in

Pincus, R.H., Geller, E.B. and Stover, E.M. (1986) A technique for using the story schema as a transition to understanding and summarising event based magazine articles. *Journal of Reading*, Vol. 30, pp. 152-158.

Direct teaching of schemata to science undergraduates, is described in

Samuels, S.J., Tennyson, R., Sax, L., Mulcahy, P., Schermer, N. and Hajovy, H. (1988) Adults' use of scientific text structure in the recall of a scientific journal article. *Journal of Educational Research*, Vol. 81, pp. 171-174.

Mental models, analogies and metaphors

That learners benefit considerably from mental model building information is described in

Mayer, R.E. (1989) Models for understanding. *Review of Educational Research*, Vol. 59, pp. 43-64.

The effectiveness of linking remarkably *different* analogies is in

Halpern, D., Hansen, C. and Reiter, D. (1990) Analogies as an aid to understanding and memory. *Journal of Educational Psychology*, Vol. 82, pp. 198-305.

Using the analogy of the beam for the mean is in

Hardiman, P.T., Well, A.D. and Pollatsek, A. (1984) Usefulness of a balance model in understanding the mean. *Journal of Educational Psychology*, Vol. 76, pp. 792-801.

Research on learners relating unknown to known words is in

Goswami, U. (1986) Children's use of analogy in learning to read: a developmental study. *Journal of Experimental Child Psychology*, Vol. 42, pp. 73-83.

Two-year-olds reasoning by analogy is in

Crisafi, M.A. and Brown, A.L. (1986) Analogical reasoning in very young children: Combining two separately learned solutions to reach a goal. *Child Development*, Vol. 57, pp. 953-968.

Adults having difficulty with reasoning by analogy is in

Gick, M.L. and Holyoak, K.J. (1983) Schema induction and analogical transfer. *Cognitive Psychology*, Vol. 15, pp. 1-38.

That the success of analogies depends directly on the nature of the instruction is demonstrated in the classic of experimental psychology by Ceci and Liker. See item 11 in ***set*** No. 1.

Ceci, S.J. and Liker, J. (1994) A day at the races. ***set*** No.1, 1994

Research in problem solving

The more expert we become the less we use general problem solving skills: see

Sweller, J., Mawer, R. and Ward, M. (1983) Development of expertise in mathematical problem solving. *Journal of Experimental Psychology: General*, Vol. 112, pp. 634-656.

For reviews of the research on this topic in chess, computing, physics, music, etc., see, for example

Frederiksen, N. (1984) Implications of cognitive theory for instruction in problem solving. *Review of Educational Research*, Vol. 54, pp. 363-407

and

McGaw, B. (1984) Acquisition of expertise in problem solving. *Australian Educational Researcher*, Vol. 11, pp. 5-26.

and

Voss, J.F., Fincher-Kiefer, R.H., Greene, T.R. and Post, T.A. (1986) Individual differences in performance: the contrastive approach to knowledge. In R.J. Sternberg (Ed.), *Advances in the Psychology of Human Intelligence*, Vol. 3, pp. 297-334. Hillsdale, NJ: Lawrence Erlbaum.

Research on child development and the emergence of literacy skills

The significant body of research on age and the growth of the knowledge base can be found reviewed in

Chi, M.T.H. and Ceci, S.J. (1987) Content knowledge: its role, representation, and restructuring in memory development. *Advances in Child Development and Behavior*, Vol. 20, pp. 91-142.

and

Ornstein, P.A. and Naus, M.J. (1985) Effects of the knowledge base on children's memory strategies. *Advances in Child Development and Behavior*, Vol. 19, pp. 113-148.

Recent studies on children's concepts in biology and astronomy are

Carey, S. (1985) *Conceptual Change in Childhood*. Cambridge, MA: MIT Press.

and

Vosniadou, S. and Brewer, W.F. (1987) Theories of knowledge restructuring in development. *Review of Educational Research*, Vol. 57, pp. 51-67.

Age differences were *not* found on learning tasks equally familiar to children of different ages: see

Ceci, S.J. and Howe, M.J.A. (1978) Semantic knowledge as a determinant of developmental differences in recall. *Journal of Experimental Child Psychology*, Vol. 26, pp. 230-245.

For prior knowledge effects in reading see, for phonology,

Stanovich, K.E. (1986) Matthew effects in reading: some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, Vol. 21, pp. 360-406.

for comprehension

Curtis, M.E. (1980) Development of components of reading skill. *Journal of Educational Psychology*, Vol. 72, pp. 656-669.

for metaphor and simile

Baldwin, R.S., Luce, T.S. and Readence, J.E. (1982) The impact of subschemata on metaphorical processing. *Reading Research Quarterly*, Vol. 17, pp. 528-543.

for writing, for example, see

Chesky, J. and Hiebert, E.H. (1987) The effects of prior knowledge and audience on high school students' writing. *Journal of Educational Research*, Vol. 80, pp. 304-313.

and

DeGroff, L.C. (1987) The influence of prior knowledge on writing, conferencing, and revising. *Elementary School Journal*, Vol. 88, pp. 105-118.

For prediction of comprehension and accurate recall, see, for example

Callahan, D. and Drum, P.A. (1984) Reading ability and prior knowledge as predictions of 11 and 12-year-olds' text comprehension. *Reading Psychology*, Vol. 5, pp. 145-154.

and

Recht, D.R. and Leslie, L. (1988) Effect of prior knowledge on good and poor readers' memory of text. *Journal of Educational Psychology*, Vol. 80, pp. 16-20.

Knowledge and intelligence

A detailed coverage of the concept of intelligence as viewed from knowledge theory is found in

Ceci, S.J. (1990) *On intelligence: More or less: A bioecological treatise on intellectual development*. Englewood Cliffs: Prentice Hall.

The study on expertise in judging horse race handicap odds is

Ceci, S.J. and Liker, J. (1986) A day at the races : A study of IQ, expertise, and cognitive complexity. *Journal of Experimental Psychology: General*, Vol.115, pp.255-266. See also the ***set*** No.1, 1994 item of the same name, mentioned above.

Are prior knowledge effects obvious?

Prior knowledge as a salient individual difference factor: for research controlling IQ and SES, see

Johnson, P. (1984) Prior knowledge and reading comprehension test bias. *Reading Research Quarterly*, Vol. 19, pp. 219-239.

For the influence of prior knowledge (even over personality factors)

Bloom, B.S. (1976) *Human Characteristics and School Learning*. New York: McGraw-Hill.

and

Mintzes, J.J. (1979) Prior knowledge and locus of control in cognitive learning among college biology students. *Education*, Vol. 100, pp. 138-145.

That prior knowledge means imbuing experiences with greater meaning: see

Pearson, P.D., Hansen, J. and Gordon, G. (1979) The effect of background knowledge on young children's comprehension of explicit and implicit information. *Journal of Reading Behavior*, Vol. 11, p. 201.

And a greater ability to attend to crucial elements: see

Spilich, G.J., Vesonder, G.T., Chiesi, H.L. and Voss, J.F. (1979) Text processing of domain-related information for individuals with high and low domain knowledge. *Journal of Verbal Learning and Verbal Behavior*, Vol. 18, pp. 275-290.

For prior knowledge helping the retention of lessons: see

Gagne, E.D., Bell, M.S., Yarbrough, D.B. and Weidemann, C. (1985) Does familiarity have an effect on recall independent of its effects on original learning? *Journal of Educational Research*, Vol. 79, p. 41.

The complex sequence of knowledge elements in, for example, early maths skills, are detailed in

Nesher, P. (1986) Learning mathematics: a cognitive perspective. *American Psychologist*, Vol. 41, pp. 1114-1122.

Is knowledge a threshold factor?

Research suggesting knowledge causes you to think more slowly and carefully before 'blurting out': see

Peterson, S.B. and Potts, G.R. (1982) Global and specific components of information integration. *Journal of Verbal Learning and Verbal Behavior*, Vol. 21, pp. 403-420.

For research into expertise see the book by Gagne et al. (above) and

Bereiter, C. and Scardamalia, M. (1986) Educational relevance of the study of expertise. *Interchange*, Vol. 17, No. 2, pp. 10-19.

Memory interference

For research on prior knowledge protecting against memory interference, see, for example:

Cunningham, D.J. and McCown, R.R. (1984/1985) The retroactive effects of prior knowledge and elaborative processing on prose retention. *Journal of Experimental Education*, Vol. 53, pp. 77-85.

Misconception effects

That original misconceptions persist without students being aware is detailed in

Anderson, C.W. and Smith, E.L. (1987) Teaching science. In V.R. Koehler (Ed.), *Educators' Handbook: a Research Perspective*, pp. 84-111. New York: Longman.

and, for example, work of the Learning in Science Project (LISP) of the University of Waikato, Hamilton, New Zealand. See, for example,

Tasker, R. From a researcher's notebook (Two lessons in one: what you taught and what they learned in science), **set** No.1, 1982, item 8.

Misconceptions are highly resistant to change - see school study

Alvermann, D.E., Smith, L.C. and Readence, J.E. (1985) Prior knowledge activation and the comprehension of compatible and incompatible text. *Reading Research Quarterly*, Vol. 20, pp. 420-436.

For our difficulties with learning and decisions involving unfamiliar events, see

Kruglanski, A.W. (1989) The psychology of being 'right': the problem of accuracy in social perception and cognition. *Psychological Bulletin*, Vol. 106, pp. 395-409.

A fascinating and insightful literature review concerned with how the mind attempts to cope with information that conflicts with preexisting ideas is found in

Chin, C.A. and Brewer, W. F. (1993) The role of anomalous data in knowledge acquisition: A theoretical framework and implications for science education. *Review of Educational Research*, Vol.63, pp.1-49.

Know-it-all effects

This effect is not well researched as such but has emerged as an incidental finding in certain studies, for example

Davey, B. and Kapinus, B. A. (1985) Prior knowledge and recall of information: Reader and text effects. *Journal of Educational Research*, Vol. 78, pp 147-151.

The fact that we may often read complex text quickly in the totally false belief that we 'understand' was shown in the Canadian study of Pressley and others, cited under schema effects. For research suggesting that comprehension during skimming depends on prior knowledge rather than new meanings see

Carver, R.P. (1985) How good are some of the world's best readers? *Reading Research Quarterly*, Vol. 20, pp. 389-419.

We overestimate our own knowledge: see

Koriat, A., Lichtenstein, S. and Fischhoff, B. (1980) Reasons for confidence. *Journal of Experimental Psychology: Human Learning and Memory*, Vol. 6, pp. 107-118.

The Matthew effect

Historical note: The concept appears to have been introduced into modern jargon by sociologist Robert Merton, writing in the late 1940s. However, under different guises the principle has been recognised for at least 70 years. In 1924 the noted psychologist E.L.Thorndyke published the results of a survey into changes in children's mental abilities over the course of a year. In 'Mental discipline in high school studies' in the *Journal of Educational Psychology*, Vol.15, p.95, he wrote

> *Those who have the most to begin with gain the most during the year. Whatever studies they take will seem to produce large gains in intellect.*

The Matthew effect has been found in many areas of human endeavour: see

Walberg, H.J. and Tsai, S. (1983) Matthew effects in education. *American Educational Research Journal*, Vol. 20, pp. 359-373.

The skewed curve is demonstrated in the following review paper

Walberg, H.J., Strykowski, B.F., Rovai, E. and Hung, S.S. (1984) Exceptional performance. *Review of Educational Research*, Vol. 54, pp. 87-112.

Some additional relevant data in the area of school achievement are discussed in the article by Biemiller (see above, the 'Lake Wobegon' paper). However the key paper in the area of reading research is

Stanovich, K.E. (1986) Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, Vol. 21, pp 360-406.

The work of Stanovich is explained carefully for teachers in

Nicholson, T. (1991) *Overcoming the Matthew Effect : Solving Reading Problems Across the Curriculum*. Wellington: NZCER.

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set
number two 1994

item 7

Whole learning, with a hypertext computer project to help

Anne Poole and *Vince Ham*

SCHOOL COMPUTERS can now provide very versatile and exciting ways for children to present cross-subject projects. Is it worth the effort in your classroom? This item will help you judge that.

IN HER CLASSROOM OF 12-YEAR-OLDS, Anne has a 'whole language' approach: the children learn from a complex web of contiguous experiences. The effect of learning is reduced if experience is too overtly broken down or separated into discreet parts, or taught in isolation from a unifying 'real' purpose which the child can see. Therefore, work in Anne's class is planned around a theme, and a wide range of language activities is likely to be going on at any one time, all based upon that theme.

Round the room are 'learning stations' providing a variety of activities. Most pupils will be working in groups. That increases the opportunity for language; the choice of the order in which things are done is in the children's hands; and so is the choice of resources. A framework of steps has been taught and re-taught:

Step 1: DECIDING the information purpose, being clear about what you are going to do;
Step 2: FINDING what is needed by locating sources of information and retrieving information;
Step 3: USING the information critically and analytically;
Step 4: RECORDING relevant findings;
Step 5: PRESENTING it clearly and accurately;
Step 6: EVALUATING how well you achieved your information purpose.

The result is that we teachers, too, in our assessment and evaluation must place a priority on understanding and meaning rather than emphasising particular skills.

Hypertext as a tool for creating computer based presentations

Hypertext is a jargon term for text or screens written so that the reader must interfere as well as interpret. Most children are familiar with computerised adventure story books, known as 'interactive fiction', where at the end of each page or screen you have to choose, for example, to pick up the gun or ring the police. Each choice leads you to a different page and the story develops differently, according to your decision. Some people become addicted to such adventure stories on computers where animated pictures of spaceships fighting, dragons stealing maidens and wizards selling magic potions abound.

The appeal of hypertext systems in schools, however, is that they can be used by teachers and students to develop *their own* interactive presentations, programs, and databases, factual or fictional: on-screen projects that allow text, pictures, and sounds to be interconnected and rapidly made available to the reader. Usually each screen is thought of as a card, like a library catalogue card, but it can have moving pictures and sounds as well as words and diagrams on it. Moreover, on each card there may be highlighted words, pictures or buttons that may be 'pressed' to take you on to another card with different consequences or more information about that word or subtopic.

In educational circles Apple computer pioneered the hypertext idea with *Hypercard*, for its Macintosh range of computers. *Magpie* and *Genesis* are similar products for Acorn Archimedes computers, while IBM machines and their clones run *LinkwayLive* and *Toolbook*. All do much the same job at different levels of sophistication and friendliness.

All allow you to design screens containing text and other images. You can add 'clip art' pictures, draw your own, or scan them in if you have a scanner. You can add flashing coloured lights or text, and, in most cases, music, spoken words, and digitised movies. But the most useful feature is the way cards, and elements within cards, can be linked to other cards. As you build up your project (building a 'stack' of linked cards is one way of talking about it) making these connections becomes the most important job.

The Role of the software

Our broad aim was to find out what the students could learn by presenting their research/project work as stacks (*HyperCard* stacks since we had access to Apple Macintosh machines). This would contrast with the more traditional poster, essay, or term paper format. *HyperCard*, *Magpie*, *LinkwayLive* and the other hypertext software packages give a uniquely interactive medium: could the children not only 'traverse information trails' but also 'blaze their own'?

We were interested in the process as much as the product. How seamlessly could this use of computer technology be integrated into a unit of work based on 'whole learning'? Would the thrill of using a new technology override quality and substance? And what particular teaching strategies were the most useful in achieving high levels of integration and independence.

The project went through two fairly distinct phases: the introduction of the technology into the classroom and its integration into a thematic, cross-curricular unit of work. It was an 'action research' project, and our conclusions, are based on (1) careful observation of pupils and teachers; (2) taped discussions by pupils while they were at the computers, and (3) interviews with them about their learning over a period of a year.

Phase 1: Introducing the software

Terms 2-3 1991.

The class was already engaged in a series of small research studies on rocks using the local museum. We set about getting the class to present that work as *HyperCard* stacks. The children were used to using computers in the classroom but we had little experience with *HyperCard* ourselves, and the students knew nothing at all of it. The students worked in groups and their research data was collected before *HyperCard* was introduced. They had two 3-hour sessions in the Mac lab at the College of Education to get their stacks started. Thereafter, the stack building continued concurrently with other classroom work using two Macintosh computers at the back of the classroom.

Timeline for the Geology Project

Visit to the Geology section of the Canterbury Museum.

Guided talking tour by the Museum Education Officer.

Classroom – discussion of things seen and learned.

Homework task set for the week 'Write down on separate library cards 10 questions about an aspect in the Geology section you would like to know more about. For each question, research and record any information you find from any source.' Note sources used.

Classroom (4 days later) – sharing of findings. The students were asked to group together according to topic chosen.

Up to this point, the words 'Computer' and 'HyperCard' had not even been mentioned. Students were aware only that the teacher was engaged in a 'little' project of her own. This was a class 'Dossier' – a stack with a file on each student with factual information about each, recording past memories, autobiographical detail and aspirations for the year.

Unveiling the true intent of the HyperCard stack

Two 3-hour sessions arranged at the College of Education, where the students learned the basics of the program and were able to get each stack up and running.

Two computers at the back of the classroom were used constantly and groups were timetabled for computer use.

Opportunities arranged for further visits to the Museum and other sources by groups who needed more material, parents helping with transport and supervision.

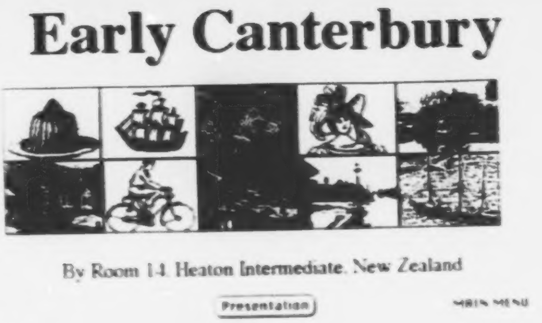
Stacks intermittently worked on in the third term, with a further visit to the College later in the year to try to bring their projects to a conclusion.

Phase 2: The Early Canterbury Project.

April – June 1992.

The next step was to repeat the exercise, but this time as part of a much more consciously integrated, cross-curricular unit.

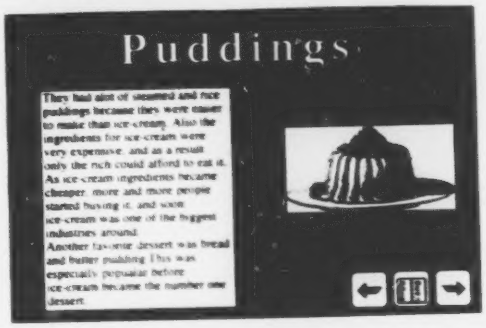
New Zealand Intermediate Schools represent a stepping stone between the primary schools, where all subjects are



Early Canterbury

By Room 14. Heaton Intermediate, New Zealand

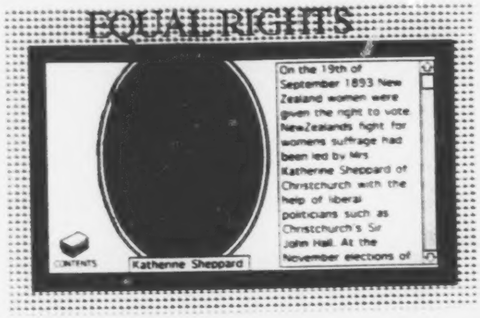
1
Early Canterbury: **The Main Menu screen**
To get to the topic you want, you move a pointer to the picture (icon) that represents it and 'click' the mouse button.



Puddings

They had alot of steamed and rice puddings because they were easier to make than ice-cream. Also the ingredients for ice-cream were very expensive, and as a result only the rich could afford to eat it. As ice-cream ingredients became cheaper, more and more people started buying it, and soon ice-cream was one of the biggest industries around. Another favorite dessert was bread and butter pudding. This was especially popular before ice-cream became the number one dessert.

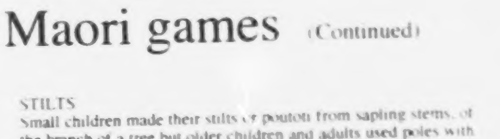
2
Early Canterbury: **A screen about colonial puddings**
One of the screens you will get if you 'click on' (select) the 'Puddings' icon at the Main Menu.



EQUAL RIGHTS

On the 19th of September 1893 New Zealand women were given the right to vote. NewZealands fight for womens suffrage had been led by Mrs Katherine Sheppard of Christchurch with the help of liberal politicians such as Christchurch's Sir John Hall. At the November elections of

3
Early Canterbury: **A screen on Equal Rights**
To get more of the story, you move a pointer to the down arrow and click the mouse button. Clicking on the 'Contents' icon takes you back to the contents page.



Maori games (Continued)

STILTS
Small children made their stilts or poutoti from sapling stems, of the branch of a tree but older children and adults used poles with separate footrests lashed on. They were used for a variety of sports, including crossing streams and wrestling on them.
GIANT STRIDES
Giant strides was a round-a-bout made by fastening a number of flax ropes to the top of a pole or tree trunk by a rope ring which acted as a swing. The favourite position was by a lake or river

4
Early Canterbury: **A screen on Maori games**
Clicking the mouse button when the pointer is on one of the four icons will take you to other screens, for example, pictures of stilts being used and children playing giant strides.

generally taught by the class teacher and there are very few, if any, specialist teachers, and the secondary schools where subjects are taught exclusively by specialist teachers. Heaton Intermediate has specialist Technicraft teachers for Metalwork, Woodwork, Clothing, Home Economics and Art. Many teachers believe there are problems when

> young people are forced to think in subjects and file knowledge and skills in mental compartments ... Life is not like that. Our sum of knowledge and understanding needs to be fully cross-referenced, and links made clear in order for us to cope successfully in a world of change.

The teachers at Heaton decided to devise a unit which would integrate the Technicraft areas with the classroom programme for a period of time.

The theme was **Early Canterbury**. The teachers met several times to establish the approach. Their meetings, and informal conversations, produced co-operative plans and teaching strategies, shared curriculum objectives, shared ideas and expertise, common curriculum goals, desired outcomes and evaluation points. Each teacher's work complemented the others. In art classes, for example, they painted 'Then and Now' murals of prominent city intersections from old and recent photographs; in metalcraft they made scale models of early planes and cars from photographs and drawings; in Clothing they created handmade quilts based on Nineteenth Century designs; and so on. In the ordinary classrooms work on language and social studies went ahead with the results being presented, in our case, as *HyperCard* stacks.

Timeline:

A day was spent data gathering in an old cemetery and walking around the central area of Christchurch, noting old buildings, plaques and sites of interest.

The *HyperCard* 'tool' was used from the start, however, having only two computers dictated that the children prepare their information 'off-line' before using the computer.

Grouping depended on interest. Some children chose to work independently, others in pairs or threes.

Research from different appropriate sources. Preparation was on cards again, but this time with instructions to think about stack design and illustrations. The cards were prepared as if on the computer and Stack Maps developed.

Once the cards were completed, the College of Education laboratory was used for the initial stack building. (6 hours.)

Back in the classroom, work on our two, sometimes three, computers proceeded alongside other Social Studies, Language and Technicraft activities.

Final assemblage and linking of all the separate group stacks into one single stack was taken over by a selected committee of seven of the most interested and accomplished Stackers.

Total time taken for the Early Christchurch Project: 8-10 weeks.

The Findings

General

We found that the second project, although more ambitious in scope, took much less class time to complete than the **Rocks** project. This was partly because of more strictly imposed deadlines, partly because the thematic nature of the unit meant that students were not leaving their 'normal' work to complete their stacks, and partly because the pupils were already proficient *HyperCard* users. In this second project there were more sophisticated and better presented stacks.

Our observations and discussions revealed that using *HyperCard* had generated and sustained very high levels of motivation over a long period of time. Many of the pupils are now eager to use *HyperCard* as a creative medium, even when they don't have to. The first project was probably not enough in itself to get them to this level of confidence, but now, after two terms of a couple of hours per week per child, they had clearly made *HyperCard* part of their kit of creative tools, along with pen, paper, video, paint etc. Their latest *HyperCard* project is writing interactive stories for younger primary school children incorporating animation and sound.

Group Collaboration

The children had worked well together, boys and girls, separately and together, and the quality of product was the better for it. A small group of boys became the 'technical' experts, fascinated with the technicalities of *HyperCard* itself, and the fancy effects they could produce. They shared this expertise with pride, but we did not feel they gained superior status thereby. This was a class of able pupils who get on well together anyway. When they were asked to evaluate each others' stacks they did so according to the quality of the content as much as the flashiness of presentation.

Student Thinking and Learning

When asked what they got out of the exercise, the students' most frequently said that they got satisfaction from having control over their learning in general and over the technology in particular. They liked the opportunity for creativity. They liked being able to make their creations fun and interesting. They felt challenged by the open-ended format of the activity, commenting that their projects were never 'finished' – 'You always want to go back and change something'. Infrequent access to the computer and not knowing the particular software procedures for doing something were the main causes of frustration.

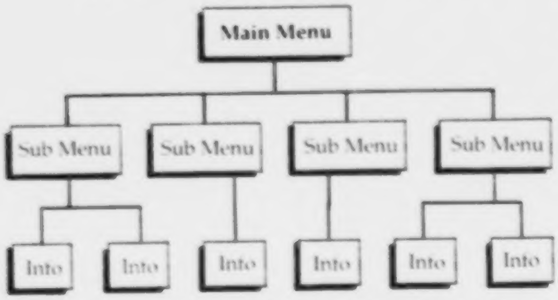
As teachers we saw that the pupils' concept of a 'school project' had changed. They produced more material than before; they were more willing (or perhaps more able) to go back and edit both content and presentation. More importantly, perhaps, they spent much more time discussing the relationships among items of information, how they linked together, what was a sub-category of what, and so on. The nature of the medium seems to have encouraged them to think of information as having depth, as being layered hierarchically, rather than as being a simple linear collection of data clipped from encyclopedias, textbooks, histories, etc. They seemed aware of (and intrigued by) the fact that what you could see was only part of what you could get.

However, although they saw their information as a hierarchy, they did not see it as a web. The typical stack map had only 3 levels, with the bulk of the information being at the last level, and there were few lateral links (see Figure 1). Only when teachers intervened did some of them begin to make extensive cross-references or lateral links within or among their stacks. This may be developmental, since the students were only 11-12 years old, but it does highlight the importance of teachers at key points in the process.

We were also struck by the long time it seemed to take for the students to create things on screen. On the other hand, the intensity of the thinking and discussion that took place while they did it was most noticeable. For example,

Figure 1

Typical Structure of Student 'Stack Map'



in one 40 minute session which we taped, the group made 1 new card, typed only 8 words, and created only 1 button with an edited icon. However, in that same 40 minute period, there were only 3 minutes in which the teacher talked to the whole class and 35 minutes of focused, on-task pupil-pupil discussion, with some 80 verbal interactions spread evenly across all cognitive levels. These interactions were about things like, 1. the sequencing necessary to solve a problem ('What you do is...'), 2. devising short term planning strategies ('What we should do now is...'), 3. experimenting with on-screen results ('Try this... no make it bigger...'). The content of their discussion was almost exclusively either software technicalities or screen layout. The other taped sessions showed a similar pattern.

Two things struck us about this. First, when they were at the computer, pupil learning dominated, rather than teacher teaching. Within a fortnight the pupils knew more about *HyperCard* than the teacher, and her role became that of prompt, organizer, facilitator, co-learner and guide, rather than that of instructor or expert. Secondly, if you judged the session at the computer by what they got onto the screen it was clear that minimalism ruled. Judged, however, by grey cell activity and on-task verbal interaction each session was very intense. Computer time was thinking and problem-solving time.

We felt good about most of this. The *HyperCard* activity was generating pupil-based activities; the children were using a learning-by-doing approach; they were engaged in a variety of language modes; they were creating their own knowledge; they were collaborating independent of the teacher, and so on.

However, we felt a little ambivalent about the way learning to manipulate the software dominated. It was pleasing to observe the pupils' involvement at the computer, but the fact that, left to their own devices, this thinking and all these interactions were almost exclusively about *HyperCard* or screen presentation, rather than about life in early Canterbury, gave us pause. Is there a difference between thinking and learning? And if there is, what do teachers have to do to turn the one into the other? What did/could the teacher do to keep the focus on the message rather than the medium?

Teaching Strategies

During the first project the students were deliberately made to collect and organize their content before the *HyperCard* medium was introduced. This was a strategy designed to avoid the novelty of the medium distracting from the significance of the message. It was, in our view, successful in this respect. It did not seem to be such an issue in the second project when there was less learning about the software to be done. Here, the key strategy for the teacher was to provide lots of off-computer research and editing time. Having few computers dictated this as a necessity, but even if 10 or 20 computers were available it is our strong contention that such off-line time should be kept high. The students did considerable extra research, content editing, stack-map planning and so on, concurrently with their stack building, but they did so only when they were away from the computer.

The other 'handy hints' we would offer to any teacher considering using this, or similar software in this way would be:

- Grouping the students (pairs or trios) not only led to better quality stacks, it was vital to achieving the language, research and other objectives of the unit.
- Pencil and paper *stack maps* (showing how you joined up various bits of information) on paper or cards are vital to the process.
- Displaying hardcopy printouts of Clip Art, Icons, possible screen layouts etc., on the wall saves a lot of time — there is less on-screen searching.
- *HyperCard* without a scanner is a car without petrol — it will move but you have to use a lot of time pushing.
- It was necessary to minimise assessment and maximize evaluation if we were to do justice to both the pupils' efforts and our educational philosophy. The integrated work is not the kind of activity you give a mark or grade to.
- We had to consciously establish procedures to evaluate the process (we used tapes, pupil logs, interviews, designated 'observation' time, and records) and not just the product.

Conclusion

Our attempt to integrate this particular software into 'whole learning' was successful: it was an effective means of cementing, focusing, and reinforcing other learning 'across the curriculum'. It was a novel, intellectually challenging, and highly motivating medium for the students to work with, and it helped meet many of the teacher's language, social, information and thinking skills objectives. It was, however, just the medium, not the message. It is what teachers do, not what technology does, that will determine how well students can turn discussion into solutions, data into knowledge, and thinking into learning.

Notes

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This item is based on an earlier account: 'Hypercard in Whole Learning at Heaton Intermediate', in *Computers in New Zealand Schools*, May 1993. We give our thanks to the editors for their permission to revise and reprint.

For more information on Whole Learning see:
Gawith, Gwen (1987) *Information Alive*. Auckland: Longman Paul.
and
Coote, Pam and Stevens, Ron (1989) *Whole Language: A New Zealand Approach*. Christchurch College of Education, Christchurch.

A good book on computers in schools is
Dalton, Joan (1985) *Adventures in Thinking*. Melbourne: Thomas Nelson, Australia.

The quotation about young people being forced to think in subjects and file knowledge and skills in mental compartments is from
Guy, Terry (1992) *Integrating the Crafts*. Unpublished In-Service Course, Christchurch College of Education.

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item 8

set
number two 1994

TAKING SCIENCE IN CHUNKS:

Students' Reactions to Modular Science and Internal Assessment

Lisa Bird and **Deborah Willis**

AT A TYPICAL SECONDARY SCHOOL the researchers discovered how successful it is to present the science curriculum in discrete separately assessed units of work. And discovered the (unhappy) effects of the in-school assessment for a national examination.

SCIENCE
MODULE FOUR
MODULE THREE
MODULE TWO
MODULE ONE

Shona McLean

Introduction to our study

Many secondary schools nowadays teach science using a modular curriculum – many discrete chunks of learning rather than a single year-long course. There is great interest at present in delivering the curriculum this way. A module, although almost 'stand alone', with its own programme, goals, and tests, is usually a segment of a year long course. We wanted, first of all, to see how students responded to science when it is taught in modules.

The study

We decided to look at what was happening in a fairly typical high school, which we called Farflung College. Modular science can be taught at many levels but we concentrated on the 5th Form year (Year 10) when the students are around 15 years old.

We had three in our research team. Each of us took part in two modules. This meant that we attended classes, took notes, made audiotape-recordings of classes and collected relevant handouts from teachers. We looked at students' work, and at the end of the module gave students a questionnaire which was concerned with their interest in the module, their motivation and thoughts about doing more science. We interviewed the teachers and a sample of students in each module.

> "...One problem was the enormous amount of material to be covered."

We looked at both the in-class and the final School Certificate science grades for students. We also looked at the scores on moderating tests; these are given to the New Zealand Qualifications Authority which works out from them a 'profile' of marks that must be followed in the School Certificate marks. In all, we studied six modules taught by four women and one man, to 66 boys and 61 girls.

Motivation for deeper study

The students were generally very keen to work hard and do well in science. However, using a questionnaire with a scale of motivation we found that many students used shallow or 'rote memory' approaches to learning the content.

Jenny: Oh I thought it was pretty silly because it wasn't really testing what we knew, or anything like that, cause all we had to do was get out some brochures or something and just copy it down.

This student was not interested in doing extra work for an assignment because she did not think it would give her a higher mark. In fact, her teacher had been hoping that students would do more than 'copy' information for this assignment. Other students did engage more deeply with the material.

One problem with the curriculum was the enormous amount of material to be covered during the year. Carrying out the relevant experiments often took much of class time. In another interview from the same module, a boy described a change in his strategies from deeper to surface learning in order to survive and do well as a student in his science studies.

Jamie: I don't really like this idea of being set heaps of work at the start of the lesson and having to go like hell through it all, cause you, sort of, end up like taking notes and that. You can rush real fast and that, and get no understanding of it with experiments. I have never really been able to understand what's going on, cause, like in third form, when we first started doing them, after a while I figured out that you, um... Rather than try to understand it all, if you just try as hard as you could to go real fast through it you could get it done and get a reasonable mark for it, even though you didn't understand it. Whereas, before that, I'd be trying to understand it and hadn't got it done – and had missed out on certain bits and so on. So I think the bad thing was, at that stage, I'd got the mentality that with experiments you just did them (laughs).

DW: Like understanding goes out the window?

Jamie: Yeah that's right.

DW: It's a shame really.

Jamie: Especially when you are set each of experiments like that with a limited time and then it really does just become an exercise.

This student seemed to regret that the workload made it difficult to have a deeper understanding of, for example, the links between experiments and theory.

Some students expressed deeper or more critical thinking about experiments. They did not just carry out the task as part of a well-rehearsed skill.

AS: Were there any things there that you enjoyed doing, or?

Lynne: Um, yeah, um (pause) I quite... I thought the slater write-up was quite interesting to do. Um, oh, you sort of... It wasn't like making up the results; you actually could form the basis of your, um, answer on what you'd seen.

AS: Mm.

Lynne: It wasn't... Um. The maze one was quite good, although mine didn't work out how, um, you know, with trial and error. It didn't work out to prove that. So I was a bit disappointed that I couldn't write that as a conclusion.

Some students, like Lynne, expressed feelings of conflict between wanting to do an assignment in a way that explored the topic more deeply and thinking that a simpler or less challenging write-up might get just as good a mark. Some forms of assessment did not allow much room for students to develop a deeper understanding of the material. At the same time, students sometimes misunderstood the requirements of a task, seeing it as more simple than the teacher had planned.

Student reactions

Some of the deeply motivated students had strong backgrounds in science, while others became enthused about science while taking the modular course. There were many positive responses from students about their experience of modular science. In a module on behaviour, several students commented on the modular format in positive ways. A pakeha (european) boy said his views of science had changed during the year.

Ted: Last year I found it really, really hard. This year I seem to have picked it up quite a lot from different teaching methods, and also having teachers really specialising in which kind of department of science they do. So it seems to work better for me. So, yeah, I think it's got easier for me.

A Maori girl doing this module expressed enthusiasm.

Sue: Oh well at the beginning of the year I was wondering why we had to do science, and I didn't really enjoy it at the beginning. But once, now, it's really good and I'm glad I've done it. I'm glad I picked the modules I did, as well.

A pakeha girl doing this module emphasised that the choice and variety in modules was one of the reasons she became more positive about science.

Karen: I've probably enjoyed it [science] more than I did in the fourth form and third form, cause it's a lot of practical stuff and you sort of feel like you're aiming for something at the end of the module. And, um, everything sort of counts, whereas it's just all being learnt. [In the third and fourth forms] um, I don't know, I found it boring. It's sort of the same thing over and over, sort of thing. But at least this year you had the option to choose. It wasn't compulsory to take something or... So, yeah, I enjoyed it.

Students expressed satisfaction with the elements of choice in the modular system, provided their choices had been realised.

Internal assessment

The fifth form year (Year 10) in New Zealand schools has for long been known as the School Certificate year. At its end, for the first time, most pupils will be facing an external exam. It is a time of escalating nervousness. For decades 'School Cert' was also the traumatic end-point of many students' education. But, by 1990, most students were going back to school for one or two more years.

During 1991 and 1992 most School Certificate subjects were examined with a final national test, but a number of schools around the country were permitted to use in-school ('internal') assessments rather than examinations for some subjects. Those assessments, monitored against the external exam, are used to award School Certificate in those subjects. Research suggests that this kind of assessment can either enhance learning or, just as likely, can produce 'more of the same' with no differences from an exam system.

Farflung College had been granted the right to award School Certificate Science by in-school (internal) assessment so we were interested to see if this type of assessment, as well as the modular programme, could enhance students' learning and motivation.

The moderation process

Each year the New Zealand Qualification Authority gives the school a distribution schema of grades it must use. The distribution is based on the school's performance on a national moderating test given to students at mid-year. So the final grades for each module are scaled to fit the distribution of grades given by the Qualifications Authority.

Most students had lower marks after moderation scaling and many reacted negatively to the scaling process. Girls' unscaled marks were somewhat higher overall than those of the boys, and, perhaps for this reason, girls' marks were scaled down more than boys. The largest downward effects were for girls taking only one science subject. There appeared to be a gender bias in the scaling.

There was some evidence that boys would have preferred assessment by a single examination and that girls put more effort overall into their ongoing work in the modules. We are carrying out further analyses of these complex gendered patterns.

> “...The students were generally very keen to work hard and to do well in science...”

Many students simply did not understand the intricacies of the complex moderation process. We have great concerns about the 'helplessness' that many students expressed when talking about it. They seemed to lose faith in the assessment process. They saw no clear link between their work in the module and the final grade they would be given after moderation. This excerpt from an interview during a Plant Study module shows how they felt.

Bruce: I'm definitely working harder now than I was [earlier in the year] and it's bringing my marks down! You know, to the... where they are in the [NZQA] test is, I think, where it is. But, yeah...

LB: So even though you're working harder, you feel like your mark is lower, is that right?

Bruce: Yeah.

LB: Because of the scaling thing?

Bruce: Yeah.

The process of scaling has potentially damaging consequences for students' motivation to continue study. Some of the positive features of the modular curriculum in science were undermined by the negative impact of the moderation process.

Finally

Our study showed that there are many positive aspects of a modular science curriculum for the learning and motivation of students. Two key problems emerged:

1. Continuity of learning across different modules: some students had a more fragmented understanding of science than they should have; they found it difficult to make links across the modules.
2. The national moderation system (i.e., scaling) has a negative impact on students' motivation.

These are some of the potholes that scar the road between the promise and the reality of an effective modular curriculum for science.

Notes

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This research is based on a report prepared for the New Zealand Ministry of Education in 1994.

> Bird, Lise and Willis, Deborah. (1994) *Links between Learning, Assessment and Motivation in Fifth Form Science Taught as a Modular Subject.* Wellington: Ministry of Education.

The authors would like to thank the Ministry and the Victoria University Internal Grants Committee for funding assistance which made this research possible.

The fieldwork was carried out by the authors and Andrea Scott. We would also like to acknowledge the valuable assistance given to the project by Anne-Marie Tupuola and Andrea Scott during the qualitative analyses, and Suzette Lismore and Stephen Haslett during the quantitative analyses. We are also very grateful to the staff and students at Farflung College who participated in the project. A special thanks goes to the teachers involved in the project, who gave us so many insights and suggestions, even as they were coping with extremely heavy teaching and marking loads as well as attending to other responsibilities at the school.

All names of participants are pseudonyms. Students' ethnic group identifications in this article are based on self-identifications in the questionnaires given to the students.

The study of how in-school assessment can either enhance learning, or, just as likely, can be simply 'more of the same' as the exam system, is

> Blackmore, Jill (1988) *Assessment and Accountability.* Geelong, Victoria: Deakin University Press.

The 'Approach to Motivation' scale is explained in

> Willis, Deborah (1990) *Involvement in academic study: an investigation of the nature, effects and development of involvement in university courses.* Unpublished PhD Thesis, Victoria University of Wellington.

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item 9

set
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Task Design, Dialogue and Learning

Andrew Tolmie
and
Christine Howe

THESE DISCOVERIES were made whilst examining groups of children working on physics, at primary, secondary and undergraduate levels. However, there are insights for all science teaching and for other subjects as well.

scientific orthodoxy
inaccurate or poorly articulated ideas
challenge children's alternative conceptions head-on
misunderstanding is rife...
...alien & hard to grasp
ignore wrong predictions

Jennifer Lautusi

Difficulties

PHYSICS PRESENTS STUDENTS of all ages with particular difficulties. These stem from the fact that even young children come to the subject with strong ideas of their own, built up over years of personal experience. For example, most young children, and many adults, believe that force is a kind of expendable energy transmitted to an object but soon used up. This is why you have to keep pushing a toy car if you want it to continue moving. However inaccurate or poorly articulated these 'alternative' conceptions are they are much used, and are the basis for a lot of mislearning. Formal knowledge seems, by comparison, alien and hard to grasp. The result is that children avoid physics, or take to rote learning. Misunderstanding is rife.

Overcoming misunderstanding

One way forward would be for physics education to challenge children's alternative conceptions head-on, and make them part of the learning process rather than something separate from it. Practical tasks that imitate scientific methods have been suggested as a means of achieving exactly this. For instance, children could be asked to predict what they think will happen in some context, see what actually happens, and if they are wrong, try to explain why. Over time, it is possible that children's ideas could gradually be brought closer into line with scientific orthodoxy.

However, few schools have the resources to set up such tasks as individual exercises. Not only that, children frequently ignore any wrong predictions they make or shrug off an unexpected result as 'an exception', especially when they are working on their own. The work of Jean Piaget suggests that when children work together, and with others who have different ideas, this ought to be productive. The process of learning is supposed to go something like this: at the time they may experience feelings of confusion as they try to make sense of apparently incompatible notions, nevertheless, it is precisely through resolution of such cognitive conflicts (later, on reflection) that understanding improves and becomes more widely applicable.

Group work studies

We had good reason then, when we began our research six years ago, to think that tasks intended to challenge children's conceptions would be more effective if they were designed for use by groups; especially groups with a mixture of ideas. In order to test this out we conducted a series of five studies. In each case, we attempted to measure whether group work improved understanding, in particular, understanding of the factors affecting what happens in a particular physical context. An example of such factors is whether something floats or sinks because of its weight, its shape, what it is made of, because it is hollow, and so on.

The five studies varied in many respects, using different ages of students (primary, secondary, and undergraduate), different group sizes (pairs and foursomes), different topics (floating and sinking, and object motion), and different ways of presenting observations (physical equipment and computer simulations). However, they all used the same basic task design: predict → test → interpret.

So, before beginning to work together, each member of the group wrote down his or her prediction (e.g., whether a piece of ebony would float or sink in a tank of tap water) for a series of six to eight examples. They then worked through these examples one by one, first of all comparing their predictions and trying to agree which was correct, then observing what actually happened and trying to agree why things had turned out as they did. Groups were carefully selected so that in some of them members all had very similar ideas about the topic in hand, whilst in others they had different ideas.

Early results

These studies established two points: **First** of all, no matter what group size, topic or form of observation was used, nor which age of student was involved, improvement in individual understanding (as measured by change between a pre-test and a post-test) was greatest for those who had been in groups in which there were *differing* ideas.

Second, careful examination of videotapes of the secondary school and undergraduate group sessions showed that the key influence on learning had been dialogue about the physical factors which affected what happened. Not only did there tend to be more dialogue of this kind in groups with different ideas, but amongst the secondary school students we found that improvements in understanding depended on the precise amount there had been. Amongst the undergraduates dialogue served a different purpose, but was still central: what mattered for their learning was the extent to which group discussion had arrived at general 'rules' (e.g., 'all heavy objects sink') to test against the various examples.

The discovery of a central role for dialogue was important because it suggested that **effective group work depends not only on members having different ideas, but on these ideas being fully aired**.

Using these results

The first requirement presents little problem. Previous research by ourselves and others indicates that the range of conceptions students of the same age hold is usually large. So, even when individuals are put into groups at random, differences can more or less be taken for granted.

As it stood, however, the effect of our task on dialogue was too variable. In order to guarantee learning, what was needed were task designs which we could be confident would actively *encourage* dialogue (about factors) in all groups. It seemed clear, though, that any such task design would have to build on the predict → test → interpret structure we had used already. Not only would it be harder to devise a new approach from scratch, but the existing design had undoubtedly been partially successful. It also had the advantage of introducing students to some aspects of established scientific procedure.

In the event, it was this parallel with formal science which suggested two ways of modifying the task which we felt might indeed ensure dialogue about factors. The first involved organising the examples that the groups examined so that they formed controlled or 'critical tests' of the influence of different factors. For instance, a set of examples in which the shape of the object was varied, but the weight in the hand, the size, the material and hollowness were kept constant, would present a critical test of whether or not that factor influenced floating and sinking. At the very least, this design ought to make each factor stand out as a focus for discussion.

The second modification involved asking groups to identify general 'rules' about whether factors mattered or not. This could be achieved by asking them at various stages of the task either to write down their own conclusions ('rule generation'), or to choose conclusions from a fixed list of alternatives ('rule selection'). Again, we felt this ought to get what we needed since the groups would have to discuss factors in order to agree on their conclusions. Moreover, the undergraduates in our earlier study had, without being prompted, engaged in identifying rules, and this had certainly seemed to help them.

In order to investigate whether tasks modified along these lines did effect dialogue and learning, we conducted two studies amongst primary school children. The first focused on the factors affecting flotation, and the second on the factors affecting heating and cooling. Primary children were an unknown quantity as far as dialogue and learning were concerned, and they were also less likely to have any previous experience to build on. If the modified designs were effective with this age range, then it seemed probable that they would be with older students as well.

The Object Flotation Study

We chose flotation as the topic for the first study because, having used it before, it was easier to flesh out the details of the four different task designs that we wanted to compare. These were: 1. *Critical Tests;* 2. *Rule Generation;* 3. *Rule Selection;* and 4. *'Random'* (which was essentially the same as we had used in our earlier research).

> “...Effective group work depends not only on members having different ideas, but on these ideas being fully aired.”

Just over 140 children aged from 8 to 12 took part. These children were individually pre- and post-tested. They were videotaped whilst they worked in groups of four on one of the four different task designs. In this way we were able to examine (a) the overall impact of the different task designs on learning, and (b) how this related to dialogue in the group.

Pre-test

The pre-test took the form of an interview, conducted out of class with one child at a time. Children were shown assorted objects such as a key and a piece of wood, and for each one asked to say whether they thought it would float or sink in a tank of tap water, and why. They were also read descriptions of a number of everyday examples of objects floating and sinking (e.g., boats and anchors), and asked to explain why these behaved as they did. No feedback was given on the accuracy of any answer.

Test

Once the pre-tests were complete, the children were assigned to foursomes at random, although always from within the same school class. This helped to ensure that differences in familiarity did not affect how the group performed. Equal numbers of groups of each age were then allocated to the four task designs. For each task the children worked through the same 18 assorted objects, which had been organised into sets of three apiece.

Taking one set at a time, groups were asked firstly to try to agree which of the three objects would float and which would sink, then to test out their predictions in the tank of tap water alongside them, and finally to discuss why things turned out as they did. When each set had been examined, they were asked to complete the task by agreeing on explanations of four everyday examples of floating and sinking. This whole sequence of activity was videotaped.

Where the four task designs differed was over the precise combinations of objects, and what use, if any, the children were asked to make of what they observed. For the *Random* task these had been arranged into sets of three that presented haphazard combinations of shape, material, weight and so on (e.g., a plastic hemisphere, a rubber ring, and a wooden die).

The *Critical Tests* task was the same as the *Random* in all respects, except that each set of three objects was arranged so as to demonstrate whether or not a particular factor affected floating and sinking. For instance, the set dealing with shape (an irrelevant factor) consisted of a plastic ball, a flat plastic box, and a plastic hemisphere, all of the same mean density, all of which sank. In contrast, the set which dealt with weight (a relevant factor since density is weight per volume) was three pieces of wood of different weight but identical size and shape; one ebony, one pine and one balsa, all painted to look the same; the ebony sank whilst the pine and balsa floated.

The *Rule Generation* task used the same sets of objects as *Critical Tests*. However, after working through each set, groups were asked to agree and to write down 'the thing which is important' for floating and sinking and 'things which don't matter'.

The *Rule Selection* task used this same format, but here groups chose their 'rules' from pairs of conflicting statements about the various factors (e.g., 'An object's shape doesn't matter to floating and sinking' vs 'An important thing for floating and sinking is an object's shape').

In order to make videotaping easier, the group sessions took place one at a time in a separate classroom. Progress through the different tasks, which took between sixty and ninety minutes, was guided by a 'workbook' from which groups read step-by-step instructions. In addition, an experimenter sat with each group as they worked through the first set of objects, helping out if they were not sure what to do. This provided an opportunity for her to encourage everyone to join in discussion, although she was also careful not to give any feedback on what they actually said.

Post-test

Four weeks after the group work sessions, all the children were post-tested using the same interview as the pre-test, but with a slightly different range of objects. To check whether any further change occurred after that, one child from each group was post-tested a second time seven weeks later.

Results

In order to assess the effects of the different task designs, we took measurements of both group activity and individual change. Each group was scored for the number of statements which had been made concerning factors (e.g., suggestions that a factor was relevant or irrelevant, or descriptions of how it worked). The *Rule Generation* and *Rule Selection* groups were also given a score for the accuracy of their 'rules', that is, whether they were right about which factors were relevant and which irrelevant. For example, if a Rule Generation group had filled in one of their cards to show that they thought air was important, but that shape, size, colour and material were not, this would have added +1 to their rule score: +1 for each of shape, colour and material, but -1 for both air and size.

Pre-test and post-test responses were scored using three measures. The first was the number of statements made throughout the interview about factors affecting floating and sinking (e.g., 'it'll float because it's light and it hasn't got any holes in it' would contribute two to this total). This provided a measure of the amount that the child said. Each statement was further scored according to whether or not the factor mentioned was actually relevant; the overall percentage of statements which dealt with relevant factors gave us a measure of how discriminating children were being. Our third measure focused on how sophisticated children's concepts were at their best. This was done by awarding a score according to how far the child had recognised both weight and size as the relevant factors, and put these together to form the idea of relative density.

Analysis

Once all the interviews had been scored, individual change on each measure between the pre-test and post-test 1, and, if appropriate, between post-test 1 and post-test 2, was calculated by simply subtracting. These values were then examined to see if the task the children had worked on had made any difference to how much they had changed. In fact, as far as change up to post-test 1 was concerned, **the tasks made no difference at all**. All the children had made more statements about factors, but a correspondingly smaller percentage of these were actually relevant: everyone was saying more but failing to make any new discrimination. Conceptual sophistication was more or less unchanged.

Between post-test 1 and post-test 2, however, clear differences emerged between the effects of the four tasks. Members of the *Random* groups, for instance, had made large gains on all three of our measures. This was interesting, because an increase in both statements about factors and the percentage which were relevant could only mean that the children had begun to place a much greater emphasis on relevant factors. Conceptual sophistication would be increasing too. What was really striking, though, was that these changes were strongly correlated with the amount of group dialogue about factors.

Children who had been through the *Rule Generation* task had also advanced, although the gains were not quite so pronounced. However, the basis for their progress appeared to be quite different. Whilst there had been almost fifty percent more dialogue about factors than in the *Random* task, the amount of discussion itself had not had any discernible effect. Instead, change in conceptual sophistication was directly related to the group rule score (that is, how accurate the group's conclusions had been).

Members of the *Critical Tests* and *Rule Selection* groups fared much worse, making fewer statements about factors than they had before. Their percentage of relevant statements and conceptual sophistication stayed static. In the *Critical Tests* task, group dialogue about factors had been markedly lower than elsewhere, and appeared to have had no positive effects. In the *Rule Selection* task dialogue about factors was most prevalent, but any positive influence this may have had, appeared to have been outweighed by the negative consequences of selecting rules: the higher a group's rule score had been, the smaller an individual's subsequent change.

Discussion

All in all then, the results of the study were considerably more complex than we had anticipated. Whilst two of the three modified task designs (*Rule Generation* and *Rule Selection*) did increase dialogue about factors, it was only in the unmodified *Random* task that such dialogue had the effect on learning that we expected. Here, the relationship between the amount of dialogue and change fitted in exactly with our secondary school findings. It also fitted in rather neatly with Piagetian theory: if group members have a mixture of ideas, then the more discussion there is, the greater the cognitive conflict should be, and the greater the eventual progress.

This argument could also be applied to the *Critical Tests* task: because there was less dialogue about factors, not enough conflict was experienced to provoke change. With hindsight it is also possible to see why there was less dialogue. Since the objects in each set were very similar it is quite likely that these groups found it easier to agree in the predictions they made, and so had less need to discuss factors.

Finally, Piagetian theory also helps to explain the fact that it took eleven weeks for differences in learning between these two tasks to become apparent: individual resolution of the conflicts produced by the *Random* task might well be expected to take a lengthy period of time.

The *Rule Generation* and *Rule Selection* tasks, however, clearly require a different explanation. Learning in both cases was influenced not by the amount of dialogue, but by the 'rules' which groups arrived at. The power of this effect is underlined by the fact that, using the same sets of objects as *Critical Tests*, the *Rule Generation* and *Rule Selection* tasks produced almost twice the amount of dialogue about factors; yet in both cases all this extra discussion was outweighed by decisions about the rules themselves. In the *Rule Generation* task this influence was positive. Although children appeared to find generating rule-like statements difficult, when they were able to do so, like the undergraduates in our earlier study, this had direct benefits for learning.

> ‘‘…Even young children come to physics with strong ideas of their own.’’

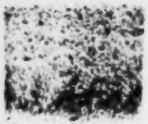
Asking children to select rules rather than generate them had a totally opposite effect: the better they were at doing this, the less they learnt. One reason for this might be that to some extent rule selection imposed solutions on groups, perhaps implying that their own discussion did not really matter.

The Heating and Cooling Study

The object flotation study left two issues outstanding. The first was that although we knew that the Rule Generation task was productive, it was less clear how it helped. For instance, whilst learning was related to how accurate a group's rules had been, it was not simply a matter of children memorising these rules. If memorisation was all that was needed, this would have shown up in the first post-test, when in fact it was between post-tests 1 and 2 that the bulk of the learning took place. Evidently, we needed more evidence before we could see what might be happening.

Two questions

One question which it seemed important to answer was whether the effect of rule generation depended in some way on the ordered observations provided by 'critical test' object sets. Whilst these had been counter-productive on their own, (bearing in mind the results from the *Critical Tests* groups) it might be that they were necessary in order to give groups enough information to arrive at a tentative agreement about which factors were important. This agreement might in turn have provided individuals with a spark



of insight which surfaced in more fully-fledged form after they had had time to reflect.

The second issue was why, if this was how it worked, the *Rule Generation* task had not been more effective than our original design, which seemed to rely solely on upsetting existing ideas. One possible clue was provided by an earlier interview study which had been conducted by one of the authors. This found that although children typically have ideas about what factors might affect floating and sinking, they have very little notion of **how these work**, of the underlying **processes** which determine that weight and size matter whilst other factors do not. It could have been this that restricted learning in the *Rule Generation* task, because children would have had no model against which to judge factors when trying to make firm decisions as to which of them mattered. For instance, unless you know that floating depends on water pushing objects up, you would have no special reason to believe that weight matters.

The plan

In order to investigate both these points, we needed to repeat our first study in a topic area where children do have some idea about processes, this time comparing a version of the *Rule Generation* task which incorporated critical testing with one which did not. As far as topic was concerned, heating and cooling seemed to meet our requirements. The same interview study had suggested that at least some primary age children have a rudimentary notion of heat transfer. This might be enough to help them grasp why some factors speed up heating and cooling and others slow it down. However, the ideas we were exploring meant that it was important that we did not explicitly ask children to focus on heat transfer. Instead we left them free to bring it in as they saw fit whilst trying to establish the factors that affect heating and cooling.

For our pre- and post-tests then, we simply showed children various containers with hot or cold water in and asked them to say how quickly they thought the water would cool down or warm up, and why. In the group task, children examined pairs of containers with hot water in, trying to predict in which one the water would cool down faster.

The method

In the designs which employed critical testing, these pairs were set up such that, firstly, only one factor, such as container thickness or surface area, was varied, and secondly, each factor was dealt with twice, in consecutive pairs. In the other designs the pairs were assembled haphazardly. Using this basic format, we compared the effect on children's progress of four different task designs, *Random*, *Critical Tests*, *Rule Generation Only* and *Rule Generation plus Critical Tests*. The last of these was equivalent to the Rule Generation design used in the object flotation study. Given the previous negative results, there seemed little point in pursuing *Rule Selection* further.

One hundred children aged between 8 and 12 took part in the study, which employed exactly the same procedures as the object flotation study, except in two respects. First of all, there was only one post-test, which took place on average about five weeks after the group sessions. Secondly, our measurements were expanded to include process. Pre- and post-test interviews and group dialogue were both scored according to how often heat transfer had been mentioned as a reason why a factor was important, and whether there was any awareness of the more specific mechanisms of conduction, convection and radiation (which we termed 'high-level' processes).

Results

Our measurements were, as we had hoped, very revealing. The *Rule Generation plus Critical Tests* design resulted in greater improvements in the understanding of process than any of the other tasks, suggesting that it was the combination of these two elements which was productive. What was more, for these children and these children only, improvement in understanding of **factors**, was a direct result of better understanding of **process**.

When we examined what had happened in the groups who had worked on this design, we found that, uniquely, they had used discussion of high-level processes to resolve their disagreements about which factors mattered. It was this which had brought about change in understanding of both process and factors.

> ..Rule generation **plus** critical tests... resulted in greater improvements.

Conclusions

Overall, three conclusions seem appropriate.

1. Both studies confirmed that task design can be used to shape group dialogue, as we had hoped might prove to be the case. In fact, since **the differences between the designs were really quite small** when seen in a wider context, **their effect on dialogue was dramatic.**

2. As far as learning is concerned, however, we were mistaken in supposing the amount of dialogue about factors to be all important. This only seems to matter under very unstructured conditions, where observations are haphazard and there is no particular pressure to come to any fixed conclusions.

   When children are asked to generate their own conclusions, this seems to override grosser dialogue effects completely. At the same time this is only productive if they have an orderly set of experiences to work on, allowing the kind of comparing and contrasting which makes it easier to spot more general rules. This is particularly true when children are able to tie factors to processes and judge their relevance in terms of how they contribute to an event.

   Even without this, though, orderly rule generation may still be of greater long-term benefit because it produces an understanding which is more explicit and more consolidated. In contrast, getting children to select from pre-determined conclusions seems to be completely unproductive, at least until they have had some chance to come up with their own ideas.

3. None of this should be taken to mean that the teacher has to relinquish control over the broad direction of children's learning. On the contrary, **setting the right tasks** (even if this puts the teacher at one remove from direct instruction) **would seem to be crucial to promoting learning**. Apart from anything else, our results make it clear that if this is done carefully it can lead, even among primary age children, to dialogue and ways of learning in keeping with much more sophisticated students.

   A word of warning is in order, though: as a comparison of our *Random* and *Rule Selection* designs shows, **setting the wrong task can be worse than providing no structure at all.**

Notes

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The *Learning in Science Project* (LISP) continues at the University of Waikato, Hamilton, New Zealand. It is one of many research investigations focusing on science learning. ***set*** items have described some of the earlier LISP discoveries, particularly those concerning children trying to fit their new learning and tenacious misconceptions together. See

White, R. Probing techniques (Two lessons in one: what you taught and what they learned in science) ***set*** No.1, 1982, item 7.

and

Tasker, R. From a researcher's notebook, ***set*** No.1, 1982, item 8.

and discoveries during the research described in item 3 in this issue

Nuthall, G and Alton-Lee, A., How pupils learn, ***set*** No.2, 1994, item 3.

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set
number two 1994

FRACTIONS:
A WEEPING SORE IN MATHEMATICS EDUCATION

Nerida Ellerton and *Ken Clements*

IN FOUR DIFFERENT COUNTRIES, including our own, the same problems keep cropping up — children do not connect simple tasks, such as **sharing**, and the written **fractions** they meet in class.

FRACTIONS FRACTIONS FRACTIONS

Jim Gorman

The Need to Establish Links in Cognitive Structure

Consider some tasks involving a half ($\frac{1}{2}$), a quarter ($\frac{1}{4}$) and a third ($\frac{1}{3}$), or related ideas:

1. I can share some chocolates, an apple pie, even a bottle of fruit juice with one other, two others and three others and we can all get fair shares.
2. I can describe this as 'dividing the chocolates, the pie, the drink, into halves, thirds, quarters.'
3. I can write down

   $\frac{1}{4}$ of 12 chocolates = 3 chocolates

   and even $\frac{1}{4} \times \frac{12}{1} = \frac{3}{1}$.

These three actions could be described as mathematics at a practical, linguistic, and symbolic level. Everyone, except perhaps the autistic, can manage the practical sharing – we would probably starve if we didn't! School is supposed to teach us the symbolic manipulation. But often the connection between the two is missing.

Here are some horror stories, two from overseas, others too close to home for comfort.

Papua New Guinea

Clements and Lean studied the concepts of fractions 59 students in Grades 4, 5, and 6 (NZ Stds 3, 4 and F1) in three Papua New Guinea Community Schools had. While all 59 students were confident and accurate when performing the 'sharing' tasks, they were much less successful on the corresponding tasks that involved formal verbal fraction language and symbol manipulation. The reality-based sharing concepts were rarely linked, in their minds, 'with the formal language of fractions or with the symbolic language of fractions; also, the formal language of fractions was not linked with symbol manipulation.' The need for these links is suggested by Figure 1.

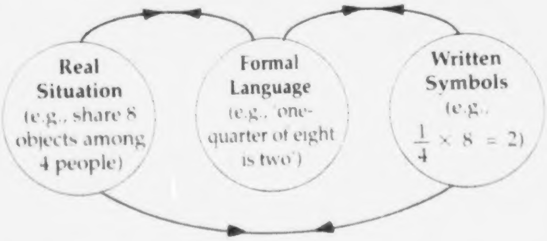
The absurdity of the situation was emphasised by the fact that, although most of the Grade 6 students were able to give correct answers to pencil-and-paper questions such as

$$\frac{5}{11} \times 792 = \square$$

many of the same students did not respond correctly when asked by an interviewer to pick up 'one-third of' a set of 12 marbles which were arranged in a 3 × 4 array in front of them. Similarly, given a full glass of water and some identical but empty glasses, many of the students did not know how to pour one-third of the full glass of water into another glass, and of those who could, only a small proportion had any idea of what fraction of the original full glass of water remained.

Figure 1

Establishing links in cognitive structure


Real Situation
(e.g., share 8 objects among 4 people)
Formal Language
(e.g., 'one-quarter of eight is two')
Written Symbols
(e.g., $\frac{1}{4} \times 8 = 2$)

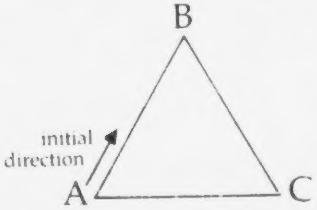
Southeast Asia

The same tasks were given to 21 Grade 4 (NZ Std 3) students at an international school in Malaysia by Leong and Ferrer. The results were strikingly similar.

One task required the children to indicate half-way, a quarter of the way, and one-third of the way around the boundary of an equilateral triangle. At an interview each was given a piece of paper on which three equilateral triangles, each with vertices labelled A, B, C, were drawn (see Figure 2). They were told that Salan wanted to move around the sides of the triangle, starting at A and going through B, then C, before arriving back at A. While these instructions were being given the interviewer demonstrated the meaning of what was being said by pointing to a triangle. Then the child was asked to indicate on the triangle where Salan would be after he had moved [illegible] (then [illegible], then [illegible]) of the way around the triangle.

Figure 2

Moving around an equilateral triangle



For these fractions, [illegible], [illegible] and [illegible], 29%, 19% and 5% of the Malaysian students got it right. (The corresponding percentages for the 59 PNG students were 14%, 5%, and 7% respectively). But even when correct, Leong and Ferrer said most answers were obviously guesses.

The children did not have cognitive structures that enabled them to link movement around the boundary of a triangle with fractions. Because the triangle was equilateral – all sides the same length – you might expect that a fairly high percentage of correct responses would have been given for the 'one-third' task, but this did not happen, neither in Papua New Guinea nor in Malaysia.

In another task the child was shown five identical clear plastic 'glasses,' one of which was full with water and the other four empty. They were handed the glass full of water and told: 'This is full of water. By pouring, and using any of these other glasses, show me exactly a half [or a third, or a quarter] of a glass of water.'

In PNG 39%, 17% and 14% got it right. In Malaysia 76%, 67% and 54%. The figures are rather different but it is still a matter for concern that so many students experienced difficulty in applying their fraction concepts to such a relatively simple situation.

In both the PNG and Malaysian schools only a small proportion of those who correctly poured out one-third of a glass of water knew that the fraction remaining in the previously full glass was two-thirds. Yet many of these same students could respond correctly to the pencil-and-paper question: What is the value of 1 – [illegible]?

Large-scale Australasian Studies

Data from pencil-and-paper tests containing items on fractions can be of limited value unless they are complemented by qualitative data (for example, from interviews) which throw light not only on the fraction concepts that children have, but also on how these relate to different aspects of their cognitive structures. Another form of data, only rarely reported, is whether children can express fraction ideas spontaneously, that is to say, without responding to someone else's direct question involving fractions. Examples of pencil-and-paper, interviews, and the spontaneous use of fractions have been gathered in studies carried out in Australia and New Zealand.

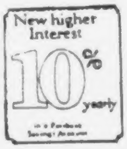
*Traditional '**Percentage Correct/Percentage Incorrect**' Analyses of Pencil-and-Paper Data*

Large-scale studies invariably show that despite the large amount of time devoted to teaching fractions, the related concepts are poorly understood. For example, in a representative sample of 6247 14-year-old children from all Australian states, 37% and 30% respectively gave incorrect answers to the following questions:

Question 4: Which fraction is closest in size to $\frac{3}{16}$?

A $\frac{1}{16}$ B $\frac{1}{4}$ C $\frac{3}{8}$ D $\frac{7}{16}$ E $\frac{1}{2}$ [37% incorrect]

Question 28: What is the yearly interest on $900 at 10%?



(30% incorrect)

In Nerida Ellerton's study, of over 10,000 secondary school students in Australia and New Zealand, she found that 15-year-olds gave incorrect answers to:

Question 16: If $\frac{3}{4} = \frac{21}{\square}$, what is the value of $\square$?

(21% incorrect)

Question 25: If $x = 6$ and $y = 21$, what is the value of $\frac{2}{x} + \frac{y}{7}$?

(71% incorrect)

Question 35: If $1 - 4 = \square \cdot 2$, what is the value of $\square$?

(78% incorrect)

Interview Data

Interviews about fractions have invariably shown that (a) few students have a relational understanding of fractions, and (b) the responses most children give to pencil-and-paper questions are usually based on mechanical, rote-learnt procedures. For instance here is a transcript from an interview Nerida Ellerton had with Nina, a 12-year-old who had answered the following incorrectly:

Question 25: If $x = 6$ and $y = 21$, what is the value of

$$\frac{2}{x} + \frac{y}{7}?$$

> *Nina:* x is six and y is twenty-one. So, I can't remember how you add fractions. Do you find a common denominator when you're in fractions?
> *Interviewer:* You may not need to if you look at them carefully.
> *Nina:* That equals – no, yes. That equals one-third. And three goes, seven into that ... uhm ... three times, and goes into that once. And that's a third, so it would equal one and two-thirds.
> *Interviewer:* You've got one-third and three over one.
> *Nina:* Three over one equals ... [pauses]
> *Interviewer:* Tell me something about three over one.
> *Nina:* Well, it's – oh, what do you call it? It's an improper fraction I think. Is that what you call it? And so you have to change it to a proper fraction. So you go one into three won't go. How did I get that? I'm not sure how I got that. I really couldn't tell you.

Even students who gave correct responses usually had little understanding of the methods they used. This is illustrated in the following transcript of an interview with 12-year-old Marion.

> *Marion:* [Crosses out x and writes 6, crosses out y and writes 21.] You've got to find a common denominator. Twelve, eighteen. Oh, you've got to go on to forty-two, I guess. Well, six sevens are forty-two, so seven twos are fourteen. Six twenty-ones are six, one six is six, six twos are twelve, fourteen and one hundred and twenty-six is four and six is nought carry the one, four, one, one hundred and forty over forty-two. [Writes out long division.] Twice, three times. [Subtracts 126.] That leaves me with...[stops].
> *Interviewer:* You've been trying to bring one hundred and forty over forty-two back to a whole number. You've got three, and you've got fourteen left over. What are you going to do with the fourteen that's left over?
> *Marion:* Ah, yes. Three and fourteen forty-twos. Yeah. And the fourteen forty twos then goes into ... seven goes into forty-two, so seven goes into fourteen goes twice. Six – that goes in again. One-third. That makes it three and one-third.

'*Make Up a Problem*' *Data*

Peter Marriott has shown that children whose teachers emphasise fraction algorithms come to think of fractions purely as symbol manipulation. The end result is that, in their minds, fractions became abstractions divorced from any reality outside school mathematics. I investigated children's perceptions of the nature of mathematics by asking them to make up and then solve a difficult mathematics problem. I found that many children were pre-occupied with fraction algorithms that is, the rules for manipulating them, for example 'of = multiply' and 'to divide turn the fraction upside down and multiply.' The following 'problem' and its 'solution' were proffered by John, an 11-year-old.

> *Interviewer:* What did you do?
> *John:* Three and five-eighths, times eight-tenths divide two and nine-twelfths. Well, first we change the three and five eighths into an improper fraction, check twenty-nine over eight, and then the eight-tenths was alright. Then I changed, then I divided ... then I changed the two and-nine-twelfths into thirty-three over twelve. Then I did it again; I did twenty-nine over eight times eight over ten, and then instead of having to divide, I timed, I multiplied, I swapped them really around so that the twelve would be on the top, twelve over thirty-three. Then I cancelled the eight into the eight, twenty-nine times one is twenty-nine times twelve is three hundred and forty-eight. One times ten is ten and ten times three is thirty, ten times thirty-three is three hundred and thirty. So that'd be an improper fraction, so I have to change it to a mixed number equals one and eighteen over three hundred and thirty.
> *Interviewer:* Just out of interest, which would you have preferred – if I'd given you the choice at the beginning – if I'd said to you,' Write a problem that would be difficult for you to do,' as against, 'Write a problem that would be difficult for a friend'? Would you have still done the same problem?
> *John:* No.
> *Interviewer:* You wouldn't have? You would have done something quite different, would you?
> *John:* Yes. Sometimes I don't get ... how it goes, say there's a dollar a kilo and there's three ... uhm ... forty-nine kilos, like that, something like that. I'm not sure how they go, but sometimes I don't get them.
> *Interviewer:* So if I had a problem . . . going to a shop and buying three packets of something at a dollar forty-nine.
> *John:* No, it's the ... you have to double it and add on, like one-and-a-half kilos is so many dollars – say you have three dollars forty-five – sometimes I get them.
> *Interviewer:* Like if it's $3.45 a kilo, and you've got to do one-and-a-half kilos?
> *John:* Yeah.

Data from the '**Write a Letter**' *Technique*

In another study, Nerida Ellerton used a 'projective' strategy to investigate the conscious and unconscious reactions of 11-year-olds.

> Imagine that you have a friend who has been ill and has missed about three weeks of school. Your friend has sent a message to you, asking you to explain what the class has been doing in mathematics so that he or she can do some extra work at home to catch up.
>
> Write a letter to your friend describing what mathematics you've been doing in class. In the letter, don't forget to give examples of some of the mathematics questions that your friend would need to be able to answer so that he or she could catch up. Make sure you explain how to answer these questions.

Stephanie, in writing to Kimberly, that they had been doing a lot of mental and written work in mathematics. Her letter, which was concerned with fractions, is shown in Figure 3.

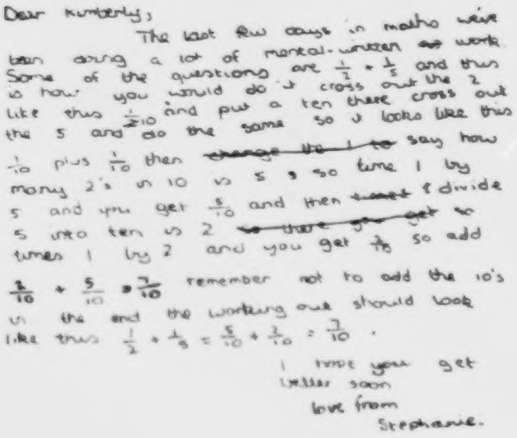
$$3\frac{5}{8} \times \frac{8}{10} \div 2\frac{9}{12} =$$

$$\frac{29}{8} \times \frac{8}{10} \div \frac{33}{12} = \frac{29}{\cancel{8}_1} \times \frac{\cancel{8}^1}{10} \times \frac{12}{33} = \frac{348}{330} = 1\frac{18}{330}$$

$$\begin{array}{r} 29 \\ \underline{12} \\ 58 \\ 290 \\ 348 \end{array}$$

Figure 3

Stephanie's letter to Kimberly



Dear Kimberly,
The last few days in maths we've
been doing a lot of mental-written ~~as~~ work
Some of the questions are $\frac{1}{2}+\frac{1}{5}$ and this
is how you would do it cross out the 2
like this $\frac{1}{\cancel{2}10}$ and put a ten there cross out
the 5 and do the same so it looks like this
$\frac{1}{10}$ plus $\frac{1}{10}$ then ~~change the 1 to~~ say how
many 2's in 10 is 5 so time 1 by
5 and you get $\frac{5}{10}$ and then ~~times~~ & divide
5 into ten is 2 ~~so there you get~~ so
times 1 by 2 and you get $\frac{2}{10}$ so add
$\frac{2}{10}+\frac{5}{10}=\frac{7}{10}$ remember not to add the 10's
in the end the working out should look
like this $\frac{1}{2}+\frac{1}{5}=\frac{5}{10}+\frac{2}{10}=\frac{7}{10}$.
I hope you get
better soon
love from
Stephanie.

Some Concluding Comments

The data in this paper reflect the fact that many children are unable to 'do' fractions; furthermore, it appears to be the case that their lack of understanding is related to their perception of fractions as being solely concerned with conundrums that require the application of fixed rules and a terminology that has no meaning outside the classroom. There is an overwhelming belief among students that fractions are all about 'getting lowest common denominators,' 'improper fractions' and remembering and applying rules. The interview with John, for example, shows that when children do attempt to apply fraction concepts to some practical situation, they find it difficult. This is because they have had very little opportunity to articulate such relationships.

We do not believe that improving the teaching and learning of fractions lies in developing ever more complex models of children's fraction behaviour. That is why we have not mentioned papers and books describing detailed theories that purport to account for children's development of rational number concepts. However, we do accept the views of Clements and Del Campo, Hiebert and Wearne, Lean, Mousley and Rice, and Mack, that teachers need to recognise that children's fraction concepts are developed through multiple encounters in real situations. Fraction concepts should be developed through real-life encounters, and instruction should aim to make the application of rote procedures to fraction symbols automatic.

As teachers we need to find ways and means to assist children to build on *informal* knowledge. This way they can give meaning to fraction symbols and procedures. The first step needed to improve children's understanding of fractions is to help students to develop appropriate mental links between (1) fraction-related, real-life situations, (2) formal fraction language, and (3) written fraction symbols.

Notes

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This ***set*** item began life as a paper presented to the 1992 Joint Conference of the New Zealand and Australian Associations for Research in Education, at Geelong University.

The studies by Clements and Lean of PNG schools is found in
  Clements, M.A. and Lean, G.A. (1988) 'Discrete' fraction concepts and cognitive structure. In A. Borbas (Ed.), Proceedings of the Twelfth Annual Conference of the International Group for the Psychology of Mathematics Education (Vol. 1, pp. 215-222). Veszprem (Hungary): International Group for the Psychology of Mathematics Education.
and
  Clements, M.A. and Lean, G.A. (1990) 'Continuous' fraction concepts and cognitive structure. Paper presented at the thirteenth annual conference of the Mathematics Education Research Group of Australasia, held at the University of Hobart, Tasmania.

Figure 1 comes from page 222 of the 1988 paper.

Early work by Leong and Ferrer in Malaysia is found in
  Leong, Y.P. and Ferrer, L.M. (1990) Children's understanding of fractions and decimals: A diagnostic approach. Penang: SEAMEO – Regional Centre for Education in Science and Mathematics (Technical Report No. 3)
and more recent raw data on the interviews is available.

Analysis of pencil-and-paper data comes from
  Bourke, S.F. and Lewis, R. (1976) Australian studies in school performance: Literacy and numeracy in Australian schools item report (Vol. 2). Canberra: Australian Government Publishing Service.
and
  Ellerton, N.F. (1989) The development of abstract reasoning in mathematics. Unpublished PhD thesis, Mathematics Department, Victoria University of Wellington (New Zealand).

Interviews with Nina and Marion are also in Ellerton (1989).

Peter Marriott's study which showed the effects of teaching fractions purely as symbols is
  Marriott, P. (1978) 'Fractions: Now you see them, now you don't.' In D. Williams (Ed.), Learning and applying mathematics (pp. 196-203). Melbourne: Australian Association of Mathematics Teachers.

The technique and results of asking children to make up a problem and solve it are explained in
  Ellerton, N.F. (1986) Mathematics problems written by children. Research in Mathematics Education in Australia, December 1986, pp. 32-42.

The Interview with John comes from this paper. See also
  Ellerton, N.F. (1988) Exploring children's perception of mathematics through letters and problems written by children. In A. Borbas (Ed.), Proceedings of the Twelfth Annual Conference of the International Group for the Psychology of Mathematics Education (Vol. 1, pp. 280-287). Veszprem (Hungary): International Group for the Psychology of Mathematics Education
and Ellerton (1989) above.
  The study using the write-a-letter technique, and Figure 3, are from Ellerton (1988) above.

The views of various researchers on learning through multiple encounters are found following research described in
  Clements, M.A. and Del Campo, G. (1990) How natural is fraction knowledge? In L. P. Steffe and T. Wood (Eds.), Transforming children's mathematical education: International perspectives (pp. 181-188). Hillsdale, NJ: Lawrence Erlbaum
and
  Hiebert, J. and Wearne, D. (1988) Instruction and cognitive change in mathematics. Educational Psychologist, Vol. 23, No. 2, pp. 105-117
and
  Lean, G.A., Mousley, J.A. and Rice, M. (1991) Variety in fraction representation. In J. O'Reilly and S. Wettenhall (Eds.), Mathematics: Inclusive, dynamic, exciting, active, stimulating (pp. 465-469). Melbourne: Mathematical Association of Victoria
and
  Mack, N.K. (1990) Learning fractions with understanding: Building on informal knowledge. Journal for Research in Mathematics Education, Vol. 21, No. 1, pp. 16-32
see also
  Clements, M.A. and Del Campo, G. (1989) Linking verbal knowledge, visual images, and episodes for mathematical learning. Focus on Learning Problems in Mathematics, Vol. 11, pp. 25-33

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item 11

set
number two 1994

A DAY AT THE STOCK MARKET

The Role of IQ in the Transfer of Knowledge and Life-Course Outcomes

Stephen J. Ceci, Tina Rosenblum, Eddy de Bruyn

Is a person with a high IQ more likely to earn more money in their adult life and profess to be more satisfied with the way their life develops than is someone with a lower IQ? And is a person with a high IQ more likely to detect relationships among events and transfer this learning to novel situations?

These are intriguing questions that lie at the heart of a long tradition of social science research on the role of IQ in everyday life. We have conducted a number of analyses that both challenge and extend the traditional wisdom on these matters and in this *set* article we essay aspects of these interrelated questions. The interested reader is referred to our full-length articles mentioned in the **Notes** section for the complete statistical and mathematical details. Here we provide only the topography of this research.

The Link Between IQ and the Transfer of Knowledge and Skills

Is a person with a higher IQ more likely than someone with a lower IQ to transfer the solution of a complex task to a closely related problem, that is, an isomorphic task? There is a surprising shortage of research designed to answer this question. What little research there is paints contradictory pictures. Although many people assume that having a high IQ facilitates transfer, and having a low IQ hinders transfer, there are too few studies to say for sure.

This question is central to one of the goals of education, because it is assumed that knowledge and modes of thinking are general; for example, a student who has mastered high school geometry should be able to employ its principles to calculate the area of a carpet. Yet, we really do not know whether someone adept at a skill in one domain (for example, in that geometry class) can transfer this skill to a new domain, nor whether a person with a high IQ will be more likely to transfer than a peer with a lower IQ.

From Racetracks to Stock markets

The Research

In order to look at the role of IQ in the transfer of knowledge and skills, two people with different IQs but with comparable problem solving capabilities in a particular domain must be presented with an isomorphic problem in a different domain. It is necessary that the two individuals be of comparable problem solving skill in the original domain, to rule out explanations other than IQ-related transfer ability. If this is done, will the higher IQ individual be more likely than the lower IQ individual to transfer their problem solving knowledge from one domain to a new isomorphic one?

Ceci and Ruiz investigated this question by studying two men who each were rated as 'experts' at harness horse racing handicapping. These two were part of a larger study of racetrack handicapping, details of which are in 'A Day at the Races' in *set* No.1, 1994. They were selected for this new study because they possessed close to the highest and lowest IQs of the men in the racetrack study, with IQs of 81 and 128, respectively. The two men had spent almost every day of their adult lives at the racetrack betting on horses, and both were considered experts, based on their excellent ability to predict 'posttime' odds. The successful prediction of posttime odds requires the use of a complex, multiplicative model in which several variables in the racing programme must be considered interactively, and assigned relative weights. In addition to calculating the odds of a particular horse winning, a successful handicapper must evaluate the odds of a given horse winning against the odds given that horse by the other gamblers.

Problems

One might argue that these two men may have become experts at handicapping differently; perhaps the higher IQ man required far less time to grasp the intricacies of handicapping than the low IQ man. Since there was no way of knowing if this was true, the transfer task provides a direct method of assessing the role of IQ in grasping new relationships. Neither expert reported having had prior experience in the stock market, and both men scored at chance on 24-multiple choice questions about the stock market, designed by a market consultant. Therefore, both men were considered to lack even a basic understanding of stock market mechanisms. This is critical, for if either man had even a rudimentary knowledge of the stock market, he may have drawn from that knowledge base as opposed to transferring his problem solving skills from the handicapping task.

The two men were presented with a problem that was isomorphic to the racetrack task at which they were expert. This new problem involved the analysis of variables in a simulated stock market task. Both men were presented 611 trials of a stock market game that required them to estimate which of two stocks would have the best future 'earning-to-price ratio', or P/E ratio (a stock's price divided by its earnings per share). One of the two stocks was always listed at the market average and the other was a stock that was to be evaluated against the average, by estimating the probability that it would yield a higher P/E ratio than the average.

Stage One

The men were presented with a single page describing two stocks along 18 different variables. The task was to decide the probability that a given stock would return a higher P/E ratio than the market average. In all respects this task was identical to the one that the men did at the racetrack, that is, the number of variables was the same, their relative weightings were identical, and the algorithm that combined them into a predictive equation was the same. In short, the same thought process that these two experts had come to engage in at the racetrack could serve them equally well in this stock market simulation — if they grasped the isomorphism between the two domains.

The men were provided with definitions and examples of each of the 18 stock market variables, and throughout the simulation they were allowed access to a glossary containing the meanings of all 18 variables. The stock information was fictitious, and the men were told that their predictions could not be improved by reading financial reports or any other kinds of studying. They were informed that some of the information to be presented was sufficient to predict which stocks would have the most favourable future P/E ratio, but that not all of the information presented would be useful for this purpose, nor would all the information be given equal importance in determining the P/E ratio. (This is also true of racetrack handicapping, though the men were not reminded of this similarity in order to avoid tipping them off about the isomorphic nature of the two tasks.)

Thus, predicting the P/E ratio of stocks was virtually identical to determining posttime odds at the racetrack. In determining these odds at the racetrack, both experts had developed an algorithm or complex equation in which seven variables interacted in a non-additive manner (see ***set*** No.1, item 11). This same equation, but with seven differently-named variables, resulted in successful P/E ratio predictions in the stock market task. It is important to note that at no time during the 611 trials were the men informed of the isomorphism between predicting odds at the (real) racetrack and at the (invented) stock market.

Goals

The goal was to see if these two individuals would realize, based on the 611 feedback trials, that:

(a) only 7 of the 18 variables were necessary to predict P/E odds;

(b) simple additive models were insufficient in predicting P/E odds;

(c) they could succeed at the task only if they created complex models akin to those they had already generated in a different domain (harness racing).

And, finally, another goal was to learn whether the expert with the higher IQ would make this realization sooner than the lower IQ expert.

The men were presented with between 4 and 12 trials of stock comparisons per day, depending upon their schedules and interest level that day. Each trial consisted of a one-page listing of the 18 variables for the two stocks to be compared (one was novel and one was the market-average stock). The men performed the task independently, and made their decision by marking on paper, the stock they predicted would yield a higher P/E ratio. Following each P/E prediction, the men were given feedback in the form of the actual P/E ratios for each of the two stocks, that is, they were told the correct answer. This format is similar to harness racing where, following an expert's estimation of probable odds for horses in a race, he then observes the actual odds.

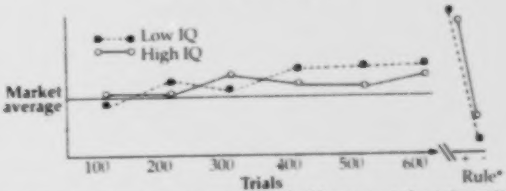
A tally was kept each day so that the two men and the experimenter could keep track of overall performance. Thus they all saw how correctly they predicted whether a given stock would return a better P/E ratio than the market average P/E ratio. The men were not permitted to discuss strategies with each other, for example, which variables were important or what equation they generated, if any.

Lack of Transfer

How successful were these men at predicting P/E ratios? After the 611 trials were completed, they still were far from adept, yet they were reliably better than chance (see Figure 1). Therefore, based on their relatively poor predictive performance, it appears that neither participant transferred the complex algorithm they had developed to expertly predict posttime racing odds to the stock market task. This lack of transfer was true for both the high and low IQ man, suggesting that general intelligence (as measure by IQ) is not related to a person's ability to transfer.

Figure 1.

Probability of predicting whether a stock will exceed the market average



*Rule + is the trials after the subjects had been given the information that the task was analogous to the racetrack task. Rule – is the trials when the correct racecourse weightings were altered without warning.

Stage Two

After the 611th trial, it was explained to both men that the same model they employed at the racetrack could be used to predict P/E ratios in the stock market task. They were then allowed an additional 25 trials to see if they could apply the equation to this context. As can be seen in the right-most portion of Figure 1, when given this information, both men quickly figured out what the seven relevant variables were and how much relative weight to assign to each of them. They reached 'ceiling' levels of accuracy during these 25 trials. When the experimenters changed the algorithm governing the stocks (that is, changed the weights and relevant variables), without informing the men, their performance dropped well below chance, indicating that the men were indeed using the same algorithm as they used at the racetrack.

Caveats

Before discussing the conclusions that might be drawn from this case study, we must first address a few caveats. First, unlike the racetrack, the men did not stand to make any financial gains nor suffer any financial losses in this stock market task. So, it resembled the racing task but without the excitement of winning or losing money. Hence, the level of motivation, although seemingly high, could not be equated with that involved in harness racing for these men.

Second, the 611 trials at the stock market task is far fewer than the number of harness races these two experts have bet on during their lives, and therefore one might wonder if the two men might have eventually became experts if more trials had been given. Analysis of their predictions made during the 611 trials, however, did not indicate that either man was continuing to improve as he approached the 600th trial. Thus, it is unlikely that more trials would have resulted in different outcomes. Yet, this differential opportunity for practice should not be completely discounted.

Finally, one must always be cautious about generalizing from a case study, that is, from an experiment with so few subjects, such as this. Perhaps the two men were not representative of other experts in some unknown way. Having noted these caveats, this study provides preliminary evidence about the transfer of knowledge and skills and its lack of relationship to IQ, particularly the 'true' relationship revealed when baseline expertise is equated. Sadly, it leads us to wonder if students do ever transfer learning from their texts to their worlds of work. As teachers we usually assume that they do accomplish that task. But do they?

The Role of IQ in Life-Course Success

It appears that neither of our two racegoers gained any sudden insight into the appropriateness of his already-developed racetrack model, but sought to develop an entirely new model. Given the task demands and the novelty of the stock market for both men, this is perhaps a wise strategy. The alternative would be for these men to go through life trying to fit a model they developed for a highly specific situation (racing) to situations that were in need of entirely different predictive models. More than one military commentator has noted that generals lose current battles by fighting the previous war.

This leads us to the provocative question of whether there is utility in transfer. In the stock market task it certainly would have been in the subjects' best interest to transfer their solution from a different domain (racing) to the current task, yet is this always the case? The question is not only, 'can individuals transfer a solution to a new domain?' but, 'can they determine when such transfer would be appropriate?'

The Usual Account

It is said that it is this ability to recognize the conditions that favour transfer that accounts for the well-known findings that high IQ individuals obtain better grades in school and earn more money in adulthood than do low IQ people. IQ is said to reflect a general disposition to grasp relationships, and it is that that has repercussions in all facets of life, including school and work.

An implication of this reasoning, is that if you have a choice between being born rich or smart, you ought to choose the latter in order to maximise life satisfaction and income! As simplistic as this question may seem, it remains one of the most debated issues of this century among social scientists.

To what extent are adult outcomes, such as earnings and life satisfaction, more predictable from childhood IQ than from childhood SES (social class)? Of course in real life one would prefer one's children to be born rich ***and*** smart. But the conclusion that was drawn from earlier research was that being born with a high IQ will explain a larger proportion of variance in adult earnings than being born into a home of higher social origins — that being born smart led to the highest earnings, the happiest life.

The Link Between IQ and Occupational Attainment

The dominant belief among social scientists in the 20th Century is that occupational success is the result of being born with the right genes for efficient cognitive processing. This, in turn, leads to success in school, on aptitude tests, and in the workplace. Jensen and others have recently claimed that the same hereditary mechanisms involved in the transmission of general intelligence (g) from parent to offspring are also responsible for the 'apparent' influence of the environment on g. That is, heredity is behind the apparent environmental influences on general intelligence, through genotype-environment correlations: certain genes propel the individual to construct environments that are associated with later varieties of intelligence and social outcomes. Hence, it is claimed, that what seem like environmental influences on later IQ (e.g., parental style of discipline) are, in actuality, genetic forces (e.g., certain types of parents choose disciplinary styles that are compatible with their genetic dispositions). For instance, Bouchard and his colleagues claim that between 64 percent and 74 percent of the difference in intelligence among individuals is genetic in origin, even though much of this may appear to be due to 'local' environmental differences.

The perspective just described leads one to draw the conclusion that social and economic inequalities are the inevitable outcome of allowing the biological basis of intelligence to manifest itself, a form of 'Social Darwinism' in which biology becomes destiny. This perspective posits that economic immobility (the poor family's children stay poor, the rich stay rich) is the result of the transmission of IQ along family lines, which, in turn, is associated with incomes that run along family lines as well. There is no lack of empirical data to bolster the claim that those with high IQ's are favoured in later earnings and occupational attainment, but the assumption that an IQ score is a valid measure of one's intelligence is a hotly contested question.

The issue whether IQ is a valid predictor of occupational outcomes is more than an academic curiosity. It gets at the essence of an important trend in the way society chooses its elites and excludes from prestige schools, programmes, and jobs, those whom it deems unfit. Those who make much use of normed tests of intelligence and aptitude (the psychometric community) view IQ as the best measure of intelligence and claim that IQ scores predict many important educational, social, and occupational achievements, in addition to being correlated with a wide range of cognitive abilities.

The Predictive Validity of IQ: The Terman Study

In 1921, Louis Terman began the best-known study of the predictive power of IQ. He studied the folders of 250,000 students in Californian public schools, children who were between the third and eighth grade. He identified 1,528 whose IQs were between 135 and 196 (the top 1 percent of the population). Almost 40 years after the study began 93 percent of the original participants who were still alive continued to participate. Approximately every 7 years these participants were interviewed, and in the 1950's their children were also tested. The most recent interviews were in 1986, when many of these individuals were entering their ninth decade.

Terman and his colleagues conducted careful interviews to determine whether these 'geniuses' were excelling in their everyday professional, financial, and personal lives. The usual conclusion, commonly found in undergraduate textbooks, is that the predictive validity of IQ has been proven because the men were highly successful in their careers, with a disproportionate number being scientists, persons listed in Who's Who, writers, business executives, or in other high-status occupations. They also tended to be mentally and physically healthier than average and to earn above-average incomes.

This is the usual interpretation found in undergraduate textbooks, and this study has been touted as the single best validator for the IQ = intelligence = real-world-success argument. The greatest error, however, committed by Terman and others who support the above equation, is the sampling bias Terman adopted in his study. One might think that because Terman selected high IQ children from all Californian children, and that 82 percent of these selected children happened to come from professional, semi-professional, and business families, nothing appears to violate statistical sampling: wrong! A closer look at the ethnic distribution among the 1,528 children shows that in Terman's sample there is not a single Chinese child, despite a sizable population at the time; only two black children and only one American Indian. This lack of adequate social-class controls for Terman's high IQ sample was a reflection of hereditarian beliefs that Terman harboured over most of his career. Terman purposively excluded schools that contained only Japanese or Chinese youngsters, and furthermore excluded schools for children who had committed minor offences. The following quote by Terman himself says it all:

> There is nothing about an individual as important as his IQ, except possibly his morals... All of the available facts that science has to offer support the Galtonian theory that mental abilities are chiefly a matter of original endowment.. It is to ... especially the top 5 percent ... that we must look for production of leaders who advance science, art, government, education, and social welfare generally... The least intelligent 15 or 20 percent of our population ... are democracy's ballast, not always useless but always a potential liability [p.658]

The fragile empirical basis for the conclusions drawn from Terman's study is troubling for many reasons. It is, after all, a classic study that has withstood widespread examination and become part of the ingrained belief system of social scientists. Since the IQ of Terman's children places them in the top 1 percent of the population, one could ask the question whether IQ 'buys' anything (in predicting adult development) after we control for parental background for children in the 70 to 130 IQ range (=95 percent of the population). Therefore, we will describe a 'bioecological' approach to studying the effects of IQ on later development, one which does take into account factors such as the socio-economic status (SES) of the family, current occupation, sex, years of schooling, education of parents, number of siblings etc., etc.

IQ and Life Achievement: A Bioecological Study

The study which we will briefly describe addresses the following question: What is the effect of childhood IQ on later life success in the workplace, specifically income? The data set comes from study known as Project Talent, started in 1959. The original data came from 400,000 high school students. About 25 percent of them were interviewed in the early 1970s. At this time the researchers obtained, among other things, information about the subjects' life-course development, IQ measures, educational attainment, occupations, income, and a very wide array of family background factors. This subgroup of 100,000 adults represents a stratified national cross-section of individuals who were in their early 30s between 1971 and 1974.

The bioecological approach to the study of the IQ/income debate involved looking at a wide array of variables that may possibly influence the system, and at all logical interactions and indirect relations among these variables, to understand processes as completely as possible. The methodology of analyses involved the use of Structural Equation Modelling. These methods, guided by bioecological theory, and using the rich data set, provided us with an opportunity to study the question in a manner quite distinct from previous research.

Results

The single most important result from the analyses was the non-existence of a net effect of IQ on income. Strong net effects on income were apparent for (1) education, (2) occupation, and (3) SES . A more complex analysis of the IQ/income relationship showed that IQ interacts with other factors such as SES. Such interactions illustrate the importance of looking in a differentiated way at ecological niches and carrying out a comprehensive assessment of indirect as well as direct effects. An examination of the jobs and professions people were in, revealed that high-IQ/high-SES people were more likely to enter the high-prestige professions than either of the other groups. This result is in marked contrast to that Terman concluded from his data. Both high-IQ/low-SES and low-IQ/low-SES groups were more likely to enter the skilled trades. In contrast, low-IQ/high-SES people were far more likely to assume a family business, for example, take over a family laundry. At the upper end of the SES distribution, low IQ people frequently earned more as owners or operators of family businesses than did their higher IQ siblings who entered the professions. Frequently, low IQ individuals who entered skilled trades earned more than average IQ individuals who entered teaching, social work, and the clerical fields.

It is clear that individuals behave quite differently as a function of their specific ecological niches. A lot depends on the age and spacing of their siblings, the level and type of resources within their neighbourhoods, the timing and duration of opportunities, etc. One can conclude that the straightforward assumptions of the Terman hypothesis are lacking. If IQ tests are, as some have claimed, true tests of general intelligence, then the results of these analyses suggest that, if forced to choose between being born smart or being born rich you ought to opt for the latter.

Notes

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Tina Rosenblum and **Eddy de Bruyn** are doctoral candidates at Cornell University.

This ***set*** item is a summary of two articles

Ceci, S.J., & Ruiz, A. (1993). 'Transfer, Abstractness, and Intelligence' in D. K. Detterman and R. J. Sternberg (Eds.). Transfer on Trial, (pp. 168-191). Norwood, NJ: Ablex.

and

Henderson, C.R. & Ceci, S.J. (1992). Is it better to be born rich or smart? A bio-ecological analysis. In *The 1990 IBM Supercomputing Competition Winners*. Athens, GA: University of Georgia Press.

The ***set*** item describing the research with racegoers is

Ceci, S.J. & Liker, J. 'A Day at the Races' ***set***, No 1, 1994, item 11.

The hot debate among social scientists this century about the relative importance of genetic inheritance and opportunities has been reviewed in Henderson & Ceci (1992) mentioned just above.

The dominant belief that occupational success is a result of being born with the right genes for efficient cognitive processing has been pressed by Jensen and others. See

Jensen, A.R. (1979). g: Outmoded theory or unconquered frontier? *Creative Science Technology*, 2, 16-29

and

Jensen, A.R. (1992). Commentary: Vehicles of g. *Psychological Science*, 3, 275-278.

The assumption that an IQ score is a valid measure of one's intelligence is hotly contested. See 'A Day at the Races' mentioned above.

An up to date general discussion of these topics can be found in

Scarr, S. (1992). Developmental theories for the 1990s: Development and individual differences. *Child Development*, 63, 1-19.

The mathematical and statistical details used in the bioecological analyses of the *Project Talent* data are beyond the scope of this paper. Those interested please see the Ceci & Henderson paper mentioned above.

Further technical reading:

Lehrl, S., & Fischer, B. (1988). The basic parameters of human information processing: Their role in the determination of intelligence. *Personality and Individual Differences*, 9, 883-896.

Lehrl, S., & Fischer, B. (1990). A basic information psychological parameter for the reconstruction of concepts of intelligence. *European Journal of Psychology*, 4, 259-286.

Plomin, R., McClearn, G.E., Smith, D., Vignetti, S., Chorney, M., Kasarda, S., Thompson, L.A., Detterman, D.K., Daniels, J., Owne, M., & McGuffin, P. (in press). DNA markers associated with high versus low IQ: The QTL project. *Behavior Genetics*.

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item 12

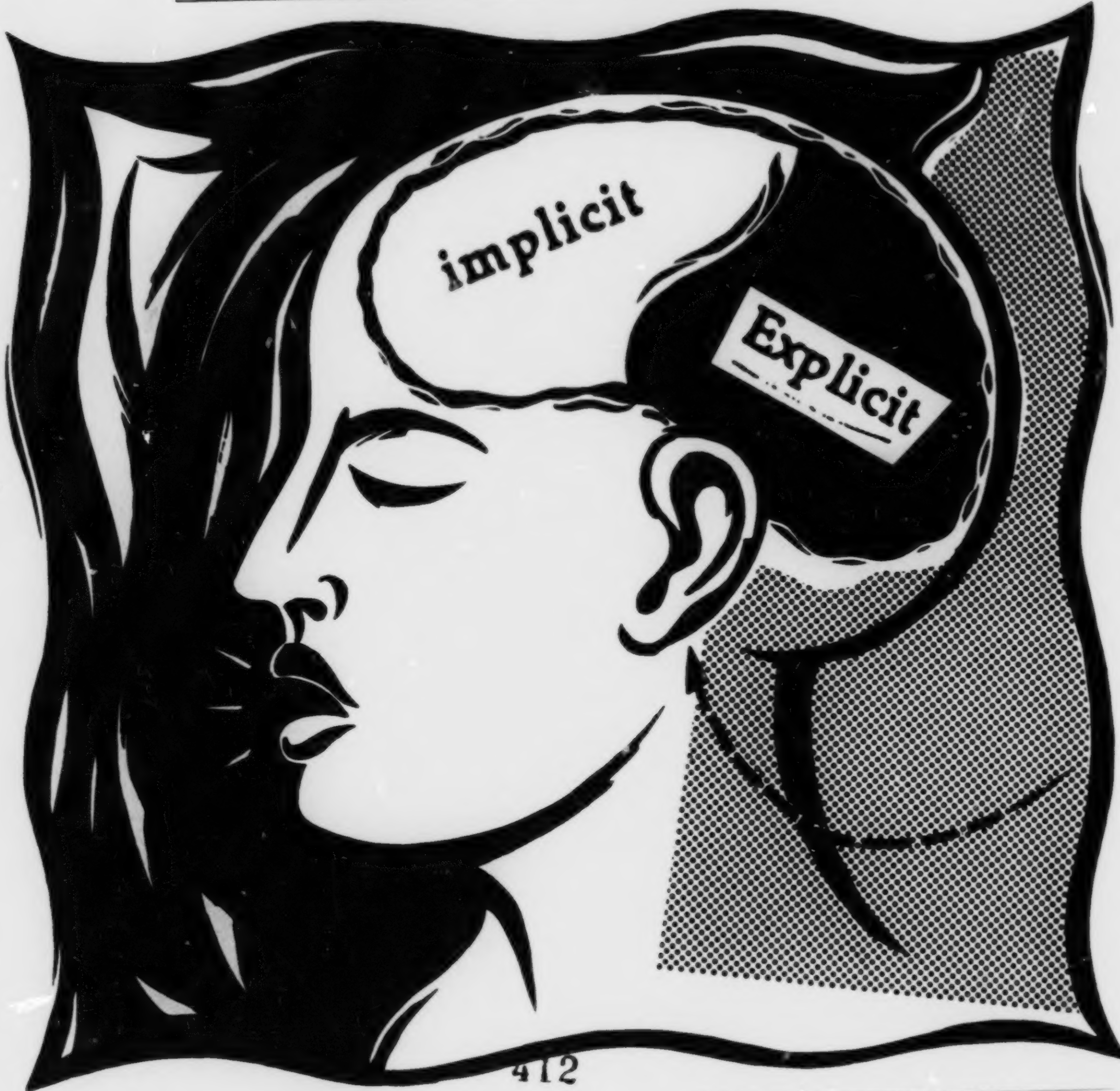
set
number two 1994

Listening and Speaking

VITAL PARTS OF ANY SECOND LANGUAGE PROGRAMME

Paul Nation

RESEARCH DISCOVERIES by experts in teaching English to speakers of other languages can be transferred to the teaching of any second language. In this item are practical examples and help with planning good teaching programmes at different levels.



Nicola Belsham

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Listening and Speaking

VITAL PARTS OF ANY SECOND LANGUAGE PROGRAMME

Paul Nation

Research and theory into learning a second language make a basic distinction: between knowing a language and knowing about it – knowing how to use a language, and knowing about what makes it tick – **implicit** knowledge and **explicit** knowledge. **Implicit** knowledge is the kind of knowledge that fluent second language users and native speakers use when they listen, speak and write. They are generally unable to describe this knowledge, and if they do, their descriptions may not reflect what they *actually* do. **Explicit** knowledge is knowledge about vocabulary and grammar etc., that has been learned through some kind of formal study or reflection.

Native speakers of English often have much poorer explicit knowledge of the language than non-native speakers. In their use of English, users often demonstrate that they have the implicit knowledge that, for example, the subject of a sentence and the following present tense verb must agree. Not all users have the explicit knowledge of the rule which would allow them to explain to someone how this agreement is carried out. Chart 1 summarises the differences between implicit and explicit knowledge. Implicit knowledge is essential for fluent language use. Explicit knowledge can help in language learning and we will look closely at this.

Chart 1

The features of implicit and explicit language knowledge

Implicit knowledge	Explicit knowledge
It is intuitive. The learner may be unable to describe the formal properties of the knowledge. This knowledge enables use of the language	The learner can describe the formal properties of the knowledge. It is knowledge *about* the language
Much of this knowledge may be built up through incidental learning	The learning is intentional and requires some obvious understanding or analysis
This knowledge is essential for automatic, fluent use. It is used to solve instrumental tasks	This knowledge allows monitored use. It is needed to solve structural language tasks

To add to the knowledge you already have, either implicit or explicit, it is necessary to notice, to be aware of, the new knowledge. **Unnoticed knowledge is not learned**

There are two types of classroom activities that can lead to language learning – those that focus on the **form** of the language by explicitly drawing attention to sounds, word parts, words, grammar, or discourse (form focused instruction), and those that focus on the **meaning** or message conveyed by the language being used (meaning focused activities).

Meaning focused activities (inside or outside the classroom) are essential for language learning. They can build up implicit knowledge of the language directly. However, 'the learner must attend subconsciously to the presence of a feature in input (i.e., notice the feature without reflecting on it).' For example, if you focus only on the message without noticing that it contains a previously unknown word, you will be unlikely to begin to learn that word.

Form focused instruction usually leads to explicit knowledge. One of the major debates in research on teaching language is the relationship between explicit knowledge and implicit knowledge. Does explicit knowledge help the implicit knowledge that is the basis of normal language use? A cautious answer from the research evidence is that explicit knowledge does not directly add to implicit knowledge – there is no implicit → explicit continuum. Facts about a language can help implicit knowledge, but this is by making us conscious of items in a message. Conscious attention to meaning, thus stimulated, starts a loop with output becoming input, leading to implicit knowledge – that is, to being able to use the language without conscious attention and effort. Form focused instruction can also contribute directly to implicit knowledge, but there are conditions and limitations on this.

Second language acquisition research indicates that there are four main strands that can make up a language course. They represent ways of reaching the language, skill and discourse goals of a course.

The four main parts of a language course

(1) *A language course should provide* ***large quantities*** *of meaning-focused, comprehensible input.* This should involve meaning-focused activity where the learners' main interest is in **understanding** and **acting on** the **messages** that they receive. This type of activity supplies input for the learners to process and activates procedures for developing implicit knowledge. Controlled practice does not seem to have this effect.

Meaning-focused input provides conditions that are most suited to the acquisition of *implicit* knowledge, essential for fluent use. It is important that this input should not be restricted to a limited range of *discourse types* – not just face-to-face talk, not just reading stories, and so on. Biber's research has shown that various grammatical aspects of the language tend to form different clusters according to the type of discourse. For example, face-to-face interaction is typified by the use of (1) time and place adverbials, (2) first- and second-person pronouns, (3) the present tense, (4) private verbs like *know* and *think*, and (5) *be* as a main verb. Imaginative narrative is typified by (1) past tense verbs, (2) third-person pronouns, (3) public verbs like *said*, and (4) present participial clauses. Experiencing a range of discourse types ensures that learners have the opportunity to meet a good sampling of the full range of language forms with a variety of communicative purposes.

As well as meeting new language items, learners should also have to listen to input that stretches their skill in comprehension. This can be when talking to someone, but interaction is not essential. What is essential is that the learners (1) understand the input, (2) notice new features in it, and (3) compare what they notice with their output. If learners (4) modify their own output as a result, the learning will be more integrated into their language system.

(2) *A language course should provide* ***some*** *form-focused instruction.* This involves focusing on a particular feature or property of the second language, and making the learner consciously aware of the correct form and its use.

Focusing on form helps learners gain *explicit* knowledge which can speed up and encourage further progress in the acquisition of implicit knowledge. It does this by making the learners aware of forms that might not have been noticed. Controlled formal practice alone does not provide the conditions for successful language learning.

There are limitations to form-focused instruction. Form focused instruction will usually only be useful for items that are formally simple and that have a clear function. Form focused instruction in vocabulary is likely to be generally effective. Some grammatical constructions like questions, negatives, and relative clauses are complicated and are learned gradually. Form focused instruction might help the learning of parts of these if the learners are at a stage in their learning which suits the particular form focused grammar teaching they are getting. Some frequently used complicated constructions like 'What's the matter?', 'That's all right' can be taught effectively as unanalyzed units. In general form focused instruction should have clear and simple goals.

Form focused instruction does not always sink in; sometimes it has only a temporary effect. Sometimes it may not seem to have sunk in at all but will appear later. Quite often it will have an effect on planned, careful speech but not spontaneous speech.

In spite of these limitations, the research indicates that formal instruction and informal exposure together work better than either of these on its own.

(3) *A language course should involve the learners in* ***producing meaning-focused output***. Much of this can be speaking on familiar topics and in supportive situations. But learners may need to be encouraged or 'pushed' to produce language.

'Pushed' output makes learners aware of gaps in their command of the language by making them use language in ways that they might otherwise avoid. Pushed output forces learners to focus on features of the language that they do not need to focus on when dealing with input. Learners' output can be pushed by getting them to produce what they have previously only used receptively. It can be pushed by having them deal with unfamiliar topics, unfamiliar genres, and unfamiliar tasks; it can be pushed by requiring them to be precise and appropriate; learners can be pushed to perform both with and without the opportunity to plan what they will say.

In some parts of the course, learners should have to speak on topics and in situations that push them to the limit of their language resources and skill, however, these demanding activities should make up only a small proportion of a learner's language use. They should, wherever possible, result in successful activity and should not discourage language use.

(4) *A language course should provide substantial opportunity for* ***fluent*** *language use.* This involves setting up opportunities for learners to listen and speak at levels that would normally be outside their present level of proficiency. This can be done by providing repeated opportunities to listen to or produce the same material, by allowing learners to work with content that is very familiar to them, or by allowing them time for preparation and practice before performing.

Learners need to become fluent in order to perform well under real conditions. Also fluency, with its automatic pronunciation, vocabulary, etc., encourages the restructuring by the learner of his or her model of the language system. This restructuring then results in a higher level of fluency based on an efficiently structured system (rather than on well-practised routines that began the activity).

Great care needs to be taken to assign the right amount of time to each strand. Also look at opportunities for learning outside class and consider the time these add to strands.

Learning goals

Learning goals can include the learning of (1) language items such as sounds, vocabulary and grammatical constructions, (2) the content or ideas of the subject being studied such as geography, English literature, mathematics, or cross-cultural understanding, (3) language skills such as listening, writing, fluency in using known items, and strategies for coping with language difficulties, and (4) the organisation of discourse such as rhetorical features and semantic constituents. Chart 2 elaborates these areas.

Chart 2

Learning Goals

General goals	Specific goals
Language items	pronunciation vocabulary grammatical constructions
Ideas (content)	
Skills	accuracy fluency strategies process skills or subskills
Text (discourse)	conversational discourse rules text schemata or topic type scales

Use only those teaching techniques which achieve learning goals. This, of course, includes techniques that are used for fun or to give the learners a break – there are many language teaching techniques that are great fun and achieve very useful goals.

The separate listing of specific goals like pronunciation, vocabulary, and fluency does not mean that each must be taught separately. One technique can achieve several goals. At times it may not be obvious to the learners what the goal is, their interest being on the message. Listening and speaking activities can serve a range of learning goals.

There are books which do a good job of describing the skill components and the nature of listening and speaking, for example, *Speaking* by M. Bygate and *Listening* by A. Anderson and T. Lynch, both from Oxford University Press. Such descriptions give us realistic expectations of what may be achieved in a course and what to look for to see if the range of knowledge and skills is being covered.

Biber, who was mentioned earlier, put text into categories based on the co-occurrence of language features. He found that he was able to group texts according to the language features that frequently occurred or which were typically absent or infrequent. We find that:

1. In order to meet the full range of language features, learners need to be exposed to a range of discourse types.
2. Being able to operate well in one kind of discourse, for example informal conversation, does not mean that a learner has the knowledge to operate well in another kind of discourse, for example formal speech, because each discourse type makes use of a different cluster of language features.
3. Having to operate in an unfamiliar discourse area is a demanding task for learners and may make them aware of gaps in their command of the language. This awareness is a prerequisite to language acquisition.

When considering the goals of a language course, the following questions are useful.

What is the needed range of goals?
Which goals are covered outside class or in other parts of the course?
What goals have to be covered in the listening and speaking part?

Reaching learning goals through language teaching techniques

All good books on teaching language contain a large number of teaching techniques. Some lead to learning, some do not! Here is an example of a good technique.

What is it? This technique is a useful way of teaching new vocabulary. The teacher gradually communicates the meaning of a word by using it in context. When the learners think they know what the word means, they raise their hands. The teacher's description might go like this, (the word being taught is *precise*):

> Sometimes it is important to make a precise measurement. Sometimes it is not important to be precise. Doctors need a lot of information to find the precise nature of a disease. If you tell me your precise age, you will tell me how old you are in years, months, and days! When you give someone precise instructions, the instructions must be accurate and complete ...

When using this technique several things are important. First, not too much information is given about the word at the beginning, so that the learners have to listen attentively to the word in a range of contexts. You work from difficult to easy, like a game-show quizmaster giving clues. Second, repeat the sentences wherever possible, by saying each sentence at least twice when it is first used, and by going back over the previously said sentences. Do not ask the first learners who raise their hands for the meaning (a translation, a synonym, or a definition), but keep on describing until most of the class have raised their hands.

If this technique is used properly, the learners will have made a very good start to knowing the word *precise*. It is, however, easy to use the technique badly, by giving the meaning too quickly, by not repeating the sentences, and by removing any challenge for attention.

The design features of this technique are the repetition of the word and its contexts, the presence of a variety of rich contexts, and the need to give careful attention to the word and its contexts in order to be able to complete the activity (by working out its meaning). These design features set up conditions that research tells us are important for language acquisition. These include (1) having a positive attitude to the activity (helped by its puzzle-like nature), (2) noticing the item, and (3) thoughtfully processing its meaning. Be aware of the important features of techniques so that you can use the techniques yourself and know what to look for when they are being used.

There are thus four important questions that can be asked about a teaching technique.

1. What is the learning goal of the activity or sequence?
   This can include a **Language** goal (vocabulary, grammar), **Ideas** (the content such as cultural knowledge, safety information ...), **Skills** (accuracy, fluency), and **Text** (discourse schemata, rhetorical devices, interaction routines).
2. What conditions does the activity use to help reach the learning goal?
   Second language acquisition research and theory suggests that there are conditions that encourage learning. These include (a) noticing (through formal instruction, negotiation, the need to comprehend or produce, awareness of inefficiencies), (b) pushed output, and (c) thoughtful processing.
3. What should a teacher look for to see if the goal is likely to be reached?
   There is usually an observable sign. Negotiation, repetition, formal instruction, and pushed output are among the most observable. Deep processing, focus on the meaning, and the need to comprehend, these are less directly observable. Presence of the signs does not guarantee learning, but looking for them may help you decide if an activity needs adapting.
4. What should a teacher do to make sure that the conditions occur?
   Some design features encourage learning; for example split information, shared information, types of outcomes like ranking, completion or distinguishing, the presence of unfamiliar items in written input, a changing audience, time pressure. Shared information tasks encourage the negotiation of meaning. A changing audience encourages unchanged repetition of previous messages.

Design features that help a particular technique achieve a learning goal are usually present in other techniques, and it is always possible to create and adapt techniques.

Design features → Conditions (& Signs) → Learning (Goals)

Planning and checking a listening and speaking programme

Teaching should depend on teaching principles derived from research and supported by experimentation and empirical investigation. We should convert findings and principles about learning into classroom practice, ... teaching is in effect, a mirror image of learning.

What should be contained in a well-designed listening and speaking course?

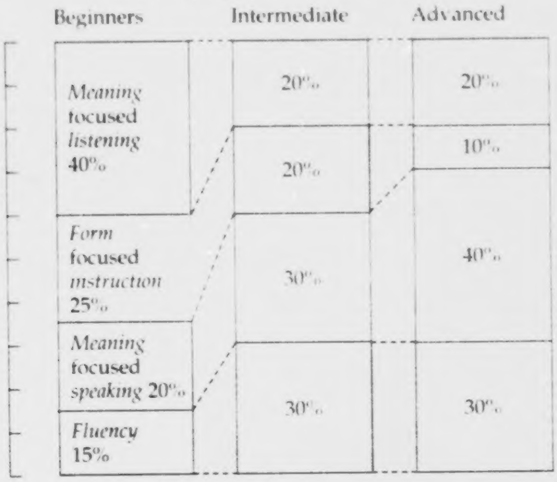
Learning a language is not a simple task and it is foolish to ignore its complexity. It is useful to be aware of the range of possible options, and then, by considering the options, make choices that suit particular needs.

The option given most attention in this article is ***strands***. Looking at these four strands together, Chart 3 gives the rough proportions of time given to each of the four strands of (1) *meaning* focused *listening*; (2) *form* focused *instruction*; (3) *meaning* focused *speaking*; and (4) *listening* and *speaking* fluency.

For example, at the intermediate level about 20 percent of the listening and speaking class time is given to (2) *form* focused *instruction*. This instruction might include pronunciation practice, vocabulary teaching and learning, grammar models and explanation, and feedback on listening and speaking performance. This is less than in the beginning of the course where the learners needed more models, guidance and explanation. Later in the course *form* focused *instruction* still has a useful role to play, although the time given to it would be less. In the advanced stages there could be formal feedback on performance (especially to get over fossilisation), vocabulary expansion, and attention to discourse and sociolinguistic conventions. In addition, many learners **expect** language courses to contain *form* focused *instruction*, and (if this can meet useful learning goals) the expectation can be usefully met.

Chart 3

Amount of listening and speaking class time given to each of the four strands where there is little contact with the language outside the school.



Meaning focused *listening* input *(1)*, should be given about 20 percent of the listening and speaking class time at the intermediate level; *form* focused *instruction (2)*, about 20 percent; *meaning* focused *speaking (3)*, about 30 percent; and *listening* and *speaking* fluency activities *(4)*, about 30 percent.

These last three strands become very difficult to distinguish from each other as learners' proficiency increases. This is because speaking activities involve others listening, group work inevitably involves a mixture of listening and speaking interaction, and fluency activities may also contribute to accuracy, the learning of language items, and discourse knowledge, as well as improving skill in use. It is probably not important to distinguish these three strands at advanced levels of proficiency. What is more important is to ensure that the learners are developing listening and speaking across a range of relevant discourse types and in demanding situations.

Here are two examples of how the four strands were made part of an actual class programme. The description only refers to the listening and speaking parts of the course. There was also a substantial reading and writing programme using four similar strands.

An ESOL (English for Speakers of Other Languages) class in a secondary school

The learners followed what was substantially the normal school programme but for five hours a week they are in an ESOL class that focused on their language development.

Meaning focused listening

Many of the learners from Asia had reasonable reading vocabularies but were not skilled at listening in English. Some of the listening activities therefore focused on bringing this reading vocabulary into listening.

1 The content matter of some of their other classes such as economics and accounting was presented by the ESOL teacher in a controlled spoken form as a preparation for its occurrence in the economics and accounting classes.

2 All classroom procedures were carried out in English.

About 30 percent of the listening and speaking programme was given to meaning-focused listening.

Form-focused instruction

Because the learners were also getting a lot of meaning-focused contact with the language in their other school classes, form-focused instruction in the ESOL class was given quite a bit of time, about 20 percent of the class time.

1 Vocabulary expansion was stressed, developing the skills of guessing from context, learning useful word parts, and learning how to use cards and mnemonic procedures such as the keyword procedure. Attention was also given to the vocabulary of academic study.

2 Learners prepared and received form-focused feedback on formal talks which they gave on topics in the ordinary school content areas.

3 There was also formal instruction in handy phrases and useful sentence patterns. Initially there was no correction of informal conversation. It was felt that correction could discourage the learners from talking. As they gained more confidence and fluency, correction was gradually introduced, although often, it seemed, with little effect!

Meaning-focused speaking

Meaning-focused speaking was given considerable attention to ensure that the learners quickly developed the skills to take an active part in normal classroom life. Learners practised presenting a point of view, taking part in organised debates, and describing a situation, a process, and the characteristics of items, all of which were closely related to their other school subjects. It was felt that there was plenty of opportunity for social talk outside the classroom and that the ESOL class work needed to focus on academic speaking. Meaning-focused speaking activities occupied about 30 percent of the listening and speaking time.

Fluency

Fluency activities took around 20 percent of the class time. The reason for this low figure was that the ESOL class to a large extent prepared learners for their other non-ESOL classes and it was hoped that the preparation in the ESOL class would allow for the development of fluency in the other classes.

1 Listening fluency tasks included listening to a story that was read as a serial three times a week. As the story was read to the learners, words from the story were put on the blackboard to help recognition. The speed of presentation gradually increased as the learners became familiar with the story-line and the characters. The stories listened to in this way included *Of Mice and Men* by John Steinbeck and *Animal Farm* by George Orwell, both in simplified versions.

2 The learners did repeated practice of prepared talks, delivering the same talk several times to different small groups of learners.

3 There was discussion of completed reading and written work from the non-ESOL classes. The learners had already put a lot of study into this so that their talk about it was drawing on a lot of preparation.

4 Each week the learners did a fluency activity such as ranking, and 4/3/2 (see later).

An intensive pre-university programme

In an intensive pre-university English proficiency programme, listening was not a high priority. The learners were living in an English speaking country and had opportunities outside class to watch television, go to films, and communicate with others (native speakers and non-native speakers) in English.

Meaning focused listening

The listening parts of the course gave emphasis to listening to formal lectures and talks.

1 Each week a visiting lecturer presented a talk on his or her speciality. This was prepared for, in class, by discussion and pre-reading. The learners took notes, questioned the lecturer, and discussed their understanding of the lecture.

2 Recorded radio programmes including news reports were used for repeated listening.

3 Each day there was a receptive information transfer activity covering topics like earthquakes, conservation and health. For example, the teacher talked, or read, about a topic and the learners filled in a prepared grid or table with notes or sometimes just ticks.

4 All classroom management was in English.

5 The learners had access to the language laboratory after class and a wide variety of tapes was available on a library system.

Form focused instruction

Learners were encouraged to use small cards to learn academic vocabulary. There was a regular class time to be tested on these each week, mainly as an encouragement to learning. There was also systematic study of word parts as a means of vocabulary expansion. Learners would do two dictations each week and gave talks on which there was written feedback from the teacher. About once a week there were some pronunciation activities on the vocabulary of the week. These activities occupied about 10 percent of class time.

Meaning focused speaking

1 Learners presented formal talks in the content area that they were going to study at university. As several were going on to post-graduate study these talks were usually very interesting. Talking in this way in front of an audience was definitely a demanding task.

2 The learners took part in group work activities usually of a problem solving nature. These included role play and simulation activities, split information activities, ranking tasks and interviews.

3 Learners discussed reading that they had done. The aim of this kind of activity was to get learners used to tutorials as well as to develop their speaking skills.

Speaking activities occupied about 40 percent of the listening and speaking programme.

Fluency activities

The activities to develop fluency used repeated tasks and prepared tasks to help learners perform at a higher than normal level.

1 The listening to stories activity described above was used.

2 In the language laboratory there was the opportunity to listen to the same tape several times.

3 Speaking activities designed to develop fluency were a regular part of the programme. 4/3/2 involves learners working in pairs, giving the same talk three times each time to a different person, but with 4 minutes to deliver it the first time, 3 minutes the second time and 2 minutes the third time. Pyramid activities such as ranking or decision-making involve the learners working by themselves to prepare what to say, then working in pairs to reach a common ranking of items, then in groups of four and finally as a whole class. This pyramid structure of increasing group size means that each learner will present and listen to the same arguments many times and thus with increasing fluency. About 30 percent of the listening and speaking programme involved learners developing fluency with known language items and discourse types.

Second Language teachers should look closely at the strands that make up their language programme. First they should check it for balance, to make sure for example that there is not too much form-focused instruction or that there is enough of it. Then they should look at the techniques and activities in each strand to see if they are likely to reach their learning goals. This planning and monitoring provides the important connection between research on second language learning and its application in second language classrooms.

Notes

Mr Paul Nation is an Associate-Professor in the English Language Institute at Victoria University of Wellington.

This paper is derived from his book *Teaching Listening and Speaking* which he is preparing for publication. This contains detailed descriptions of many of the techniques mentioned in this article. His book *Teaching and Learning Vocabulary* (1990) New York: Heinle and Heinle looks at form focused and meaning focused vocabulary learning.

An excellent introduction to the research which suggests the need for the four strands can be found in

Ellis, R. (1990) *Instructed Second Language Acquisition.* London: Basil Blackwell.

Ellis also looks closely at the effect and value of form-focused instruction.

Swain was the first to suggest the importance of output in determining what is learned. She argues that when we listen we do not need to think much about the words and constructions that are used. When we speak however we have to move to a different kind of processing, accessing wanted forms and making choices of lexical and grammatical items to suit our message. Speaking thus makes learners give attention to items that we did not have to think much about in listening.

Swain, M. (1985) Communicative competence: some roles of comprehensible input and comprehensible output in its development. In S.M. Gass and C.G. Madden (eds.) *Input in Second Language Acquisition.* Rowley, Mass.: Newbury House. 235-253.

Biber's research on the formal features of different types of discourse is most accessible in

Biber, D. (1989) A typology of English texts. *Linguistics* 27: 3-43.

Two very readable and practical books on listening and speaking are:

Anderson, A. and Lynch, T. (1988) *Listening*. Oxford: Oxford University Press.

Bygate, M. (1987) *Speaking*. Oxford: Oxford University Press.

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set
number two 1994

Diversity (and Geometry)

IN A MULTICULTURAL SCHOOL

Neil Pateman

IN THE 'SALAD BOWL' of ethnic and cultural diversity of Hawai'i there are attempts to make school work more relevant to all cultures, including involuntary minorities such as the indigenous Hawaiians. Teaching geometry in new ways is the focus of the research described.

The Conundrum of 'School Performance'

MAKING SCHOOL SUBJECTS, including mathematics, relevant to the daily lives of children is a great aim. But there has been little research that helps make maths relevant to children of non-western cultures. This case study may help.

The history of Hawaiians in Hawaiian public schools is unfortunately dismal; Hawaiian students are regarded as essentially, inevitably, unsuccessful. This is not at all an unfamiliar story to those who have worked with aboriginal Australians, the Maori, American Indians, black Americans, or hispanic Americans. It is also a familiar tale in Japan with the aboriginal Buraku and Japanese Koreans.

At first sight it seems that there is a simple explanation: there are massive cultural differences and an unwillingness or inability on the part of the minorities concerned to assimilate those elements of the dominant culture that enable school success. This simple theory lays the blame squarely at the feet of members of the 'unsuccessful' minorities.

But there is now abundant evidence that being culturally different from the majority, alone, does not explain minorities' lack of academic success. The recent waves of Asian immigration from Vietnam and Laos, for example, and from Pakistan, have resulted in a whole generation of minority students in the USA who have taken on the existing system and excelled in it.

> ...Involuntary minorities include those whose forebears were colonised by invaders.

A West African researcher, John Ogbu, is highly critical of studies which do not go beyond the school context in looking for explanations of relative performance. He suggests that in colonized countries (and those that had slaves) there eventuate two kinds of minorities: **voluntary** and **involuntary**. Involuntary minorities include those groups whose forebears were pressed into slavery, and indigenous peoples who were colonized by invaders. These peoples have continued to develop their culture, but opposition to the colonists' or slave owners' culture has become an important part of the minority culture. One form of opposition is to reject the system of schooling imposed by the (former) oppressor.

An expression of this is reported in Hawaiian schools by D' Amato. He claims that involuntary minorities have little reason to be interested in school. School provides few opportunities for social mobility among the networks they find important. He further suggests that the balance of power in classrooms lies with these children **because teachers control things the children do not necessarily need**. The teachers control content (for example, maths, science, English, and American history) and the assessment of this content, and thus avenues to employment. But these are irrelevant to the lives of Hawaiian children. They need secure family networks and chances to succeed in their own culture's eyes. The title of D' Amato's paper indicates one dimension of the ensuing problems: *'Acting': Hawaiian Children's Resistance to Teachers.*

Ogbu suggests that, in marked contrast, the members of **voluntary** minorities see schooling in their chosen country as a very positive experience, one that will allow their children to move beyond the circumstances that led them to leave their homeland, and into the mainstream of the new majority culture.

The Case of Gender

I said that there are few studies in mathematics learning concerned with cultural influences. There is an obvious exception: gender. This is the one cultural influence on mathematics learning that has been under the microscope now for many years. The differences in achievement are now well-documented. Girls outperform boys in number and logic, while boys score more highly in measurement and geometry. Fewer girls do maths in almost all Western countries. Proportionally more boys get to the highest achievement levels, but a disproportionate number of boys need remedial help. We have theories that attempt to explain the differences but we do not really know why things are as they are. At least, in recent times, there has been a shift from asking 'Why **can't** girls do as well as boys in mathematics?' to 'Why **don't** girls do as well as boys in mathematics?'

Setting the Scene

Hawaii is not so much a melting pot of cultures as a salad bowl. There are Hawaiian-Americans, Filipino-Americans, Japanese-Americans, Chinese-Americans, Vietnamese-Americans, Laotian-Americans, Caucasian-Americans, Thai-Americans, Korean-Americans, Tongans, Samoans, Pacific Islanders from a bewildering number of small islands, and then every possible combination of all those taken three and four at a time.

There are large numbers of immigrants from each of the countries mentioned. Nowadays with modern communications and comparative wealth these immigrants preserve close links with their homelands. Thus aspects of many cultures continue to flourish.

> “...Nowadays immigrants preserve close links with their homelands.”

There is no cultural nor ethnic group with a clear majority. However, in the schools a rather unusual situation has arisen: the majority of teachers are Japanese-American. This same majority is also in evidence in the State Department of Education. Thus the diversity among the general population is not at all reflected in the makeup of those responsible, directly and indirectly, for the provision of education.

The isolation of the state from the mainland and the fact that it is an internationally-popular tourist destination has added further to the development of Hawai'i as a unique place multiculturally. There is a recognition of the importance of tolerance of variety in manners and customs because that is an economic imperative; the tourist dollar enjoys a pre-eminent position in the island economy. However, one can detect the feeling that this is not to be achieved at the expense of denial of things local.

To further complicate this scenario, it is only recently that at the secondary level Hawaiian schools became fairly uniform: there were originally English Standard schools where entrance was determined by the ability to speak Standard English. The issue of pidgin and whether its use by students should be permitted in schools is a very real one today. Thus there is a lingering legacy from the old plantation days related to the paramount importance given to speaking 'proper' English. Hawai'i also has a large number of private schools. One group of private schools, Kamehameha Schools, requires that its students prove that they are at least part Hawaiian. This adds another level of complexity to the situation.

Finally a really strong influence lying across all the other cultural, educational and commercial interests is that of the traditional Hawaiian culture. At this time there is a resurgence of pride in things Hawaiian: several elementary schools have elected to teach entirely in the Hawaiian language, with only one hour of instruction in English daily. Most elementary schools invite kupuna (older folk) into their school to maintain a strong sense of Hawaiian culture. At secondary level, most schools offer a course in Hawaiiana to continue along that path. Among the general population there is a vociferous minority calling for sovereignty to be restored to the Hawaiian people. Thus there is a strong political flavour to the mixture.

The diversity described so far is almost exactly to be seen in the University laboratory high school in which a project aims to create a new geometry curriculum; a curriculum which is to be inclusive in every possible sense. For example, all students at the school take geometry, regardless of 'ability.' Every class contains a range of ethnic backgrounds and abilities. The school also has a similarly broad distribution of socioeconomic levels. An important part of the research project is to monitor its own success.

Instructional Approach

In most geometry classrooms the usual way instruction is given is for the teacher to present some information to the children; then to ask a question to be answered by one child nominated by the teacher. At this point the teacher makes a judgment of the student's response and so the lesson proceeds, usually with the teacher telling the children some more. After students have done some seatwork related to the presentation the teacher will usually sum up the lesson. Homework will be set to allow students to practise the mathematics 'learned' that day.

The pattern of instruction in the Hawai'i project is very different, beginning with the place of homework. The teaching methods are based on the belief of project staff that students construct their own knowledge, given the opportunity to experience and then time to reflect on that experience. Therefore the students tackle previously-unseen problems, each night, as part of their regular homework assignment. The next day the teacher calls on different students to present their solution attempts to the whole class and to lead a discussion about the new problem. Students learn that it is expected of them to find solutions which are different from other students. The teacher (also the principal researcher in the study) does not act as a giver of knowledge, other than to provide conventional symbolism when appropriate. Under this scheme it is expected that concept development takes place over several days; each evening's homework includes problems similar to those given initially on a topic, thus giving the children the opportunity to develop ideas over time.

Another aspect of the teaching style is the use of pairs and small group interaction on problems rather than always expecting individual students to present a solution to the whole class. Two different methods for choosing groups are used; in the beginning the teacher designates group members; as the class becomes more accustomed to working this way the teacher allows the students to form their own groups. During some classes the teacher will revert to assigning groups himself, but this occurs infrequently. (It is sometimes used as a form of discipline.) Pairs are nearly always determined by the students themselves.

Students' knowledge is thus produced partly in their personal attempts to solve the problems before coming to class, and partly out of class discussion with other students the next day.

Workshops using manipulation and computer sessions based on interactive software (specially developed for this class) are also used as further means of developing intuition. The content is chosen to reduce the traditional emphasis on proof, although students are expected to justify their responses. The usual two-column form of proof that dominates most high school courses in geometry in the United States plays no significant part in this course. Rigid motions, similarity and congruence axioms, underlie the course and are developed from the pupils' intuitions. Many of the problems are 'real' in the sense that they are about situations either common or imaginable for students.

An important element of the project is that it is overseen by a committee of 12: five project team members, five teachers from local schools, and two members of the mathematics faculty at the University of Hawai'i. The committee meets monthly to check progress and discuss upcoming problem sets, and their place in the overall course. Opinions are freely exchanged in open and frank interchanges: the mathematics faculty members take their role seriously, visiting classrooms, producing numerous and detailed suggestions for new problems and rewrites. The Committee has a genuine guidance function.

Focus of this Study

The Hawai'i Geometry Project when it began did not expect to study questions of cultural influences closely. The original request for a grant made a great deal of the fact that the students were ethnically-diverse, but no commitment was made to investigate the effects. In fact few promises could be made. However, the classes do have a great mix of achievement and ethnicity so this represents the first attempt to study the effects of cultural influences.

Before they start geometry classes all the students already have opinions about how they stand in relation to mathematics, and they know how they stand in relation to others in the class. Many of these students have been together at this school since elementary school days; it is a small school in American terms with a graduating class usually around 50 or 60 students. The multiethnic makeup of the class is an everyday commonplace reality of life for these students. The major complicating factor for students as they begin to participate in the class are the different expectations the teacher holds for them.

> "...Every class contains a range of ethnic backgrounds and abilities."

Questions that come easily to mind but are not yet answered include:

- How effectively can constructivism inform the practice of a teacher when the students continue to see mathematics as something transmitted to them rather than something they construct out of their own activities, including physical, mental, and social?
- Are there ethnic or gender-related constraints or differences in this presumed process?
- What of the possibility of an interaction between gender and ethnicity?
- Is participation strictly determined by gender?
- Is ethnicity a factor in the willingness of a girl or boy to speak up in the class?
- How strong are the cultural influences in the class on individuals speaking up about their own solutions and in criticizing the solutions of others?
- Are there sanctions that are ethnically-determined?

Two things are clear when looking for answers:

(a) most 'European' ways of gathering data, such as questionnaires and interviews, are not going to give valid answers: there will be resistance to 'filling in the forms' and at interviews researcher and child will probably be 'talking past each other'.

(b) in a classroom of adolescents enjoying the kind of diversity I have described, an almost autonomous and dynamic classroom culture can be expected to have quickly sprung into life.

Observations and Discussion

1. I have observed a critical transition when the students in the class begin to accept the different nature of the class; initially there is a struggle for many as they come to terms with different expectations. Each year this takes some time and each year I have heard more than one student in each class complain that they should get the teacher's salary because they are doing all the work! This is a clear indicator of the frustration many feel as they come to terms with the expectations the teacher has for them. He tells them clearly in the beginning, but of course some things must be lived to become part of one's reality! The transition point is passed when unselfconscious questioning of peers by peers begins and fewer and fewer heads turn automatically in the direction of the teacher. When questions of substance are directed to other students a genuine interest in the problems being tackled has begun.

2. The way the subject is taught has another spin off: the pupils choose working partners with very little concern for ethnicity; indeed popularity is much more a function of (a) ability to solve a problem, and (b) who one's friends are. Because many of these students have spent a great deal of their school lives together the observations made here cannot be generalized beyond the school. The year these observations were made (1991) there was a clear split along gender lines: it was rare for a girl to choose to work with a boy and vice versa. However, when the teacher assigned girls to work with boys, or vice versa, they didn't protest.

3. There is a constant stream of discourse flowing the whole of class time; this is interspersed with what seem to be utter irrelevancies. But picking up an irrelevancy has led to some enlightening moments. Often the writers of the course learn that their problems need better editing, but sometimes a student really does have a point that is worth pursuing. At other times a student will make a comment that draws incredulous, or derisive, or occasionally solicitous responses from fellow students. Sometimes the first will sheepishly say, 'Never mind.' At this point the teacher must make a decision about inviting some further discussion or letting the matter drop. These comments are not more commonly made by boys or girls, or by one ethnic group more than others. (A tentative finding, at present.)

4. The strongest influence on the students in this classroom is the classroom culture itself. In this class it is a special culture. It is not merely an aggregate of aspects of being Hawaiian, or Japanese-American, or haole (European) or a member of any other ethnic group, though this does affect communication. I suspect that the students recognize that this classroom is not about the transmission of prepackaged information, nor about the reproduction of other people's mathematics, although I think it unlikely that the students themselves could articulate the situation in these terms.

   In this classroom the culture values the engagement of its members in a participatory discourse. Its members are learning to take responsibility for developing their own knowledge of geometry. In this culture the struggle to make meaning is of paramount importance. At times it is a noisy, and seemingly chaotic struggle, but a worthwhile one because students who would not be allowed to participate in geometry in other settings can experience a considerable measure of success independent of gender and ethnicity.

Notes

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and

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Malone, J.A. & Taylor, P.C. (Eds)(1993) *Constructivist Interpretations of Teaching and Learning Mathematics.* Perth: Science and Mathematics Education Centre, Curtin University of Technology

The quotation from D'Amato is from:

D'Amato, J. (1988) 'Acting': Hawaiian children's resistance to teachers. *The Elementary School Journal,* Vol. 88, No. 5, pp. 529-544

Ogbu's ideas can be found in:

Ogbu, J. (1983) Minority status and schooling in plural societies. *Comparative Education Review,* Vol. 27, No. 2, pp. 168-190

and

Ogbu, J. (1989) The individual in collective adaptation: A framework for focusing on academic underperformance and dropping out among involuntary minorities. In L. Weis, E. Farrar, and H. Petrie, (Eds.), *Issues, Dilemmas, and Solutions,* pp. 181-204. Albany, NY: SUNY

Further Reading

Harre, R. (1980) *Social Being: a Theory for Social Psychology.* Oxford: Blackwell

Willis, S. (1989) *Real Girls Don't Do Maths.* Deakin Monograph. Geelong: Deakin University Press

A sample problem

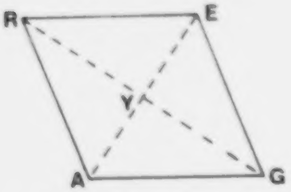
This problem was set for homework after class discussion in which the pupils tried to define a rhombus.

In rhombus R E G A, RY = YE and RE = 10 cm

a. Find the perimeter of rhombus R E G A

b. Find the area of rhombus R E G A

c. What do you notice about rhombus R E G A



The next day the teacher invited the pupils to select problems to present to the class. One of them, Andrew, chose this problem. After the children had worked for 5 minutes preparing overhead projector transparencies of their problems the teacher invited Andrew to present his solution. All the names here are pseudonyms, correct for sex but not for ethnic mix.

Teacher: OK. Andrew come up and show us what you have.

Andrew: I don't know if this is right. It says RY = RE so everything is 10. [Andrew marks the diagonals bisected as all equal.] So the perimeter is 40. I don't know how to find the area. [Another pupil: Ten by ten.] 10 by 10 wouldn't work because it's not a square.

Teacher: Betty had an idea. Help him out.

Andrew: What about? For the area? What you got?

Charlie: 100. Get the mid-section [a bit indistinct.] 10 by 10.

Teacher: What do you think about Charlie's idea? Andrew is doing a good job leading this problem, so get your heads up and help him out.

David: How do you get 100 again?

Teacher: What was Charlie's idea?

Charlie: Add top and bottom.

Eric: Why?

Charlie: To get the mid-segment.

Teacher: So where's the mid-segment? [Andrew redraws a diagonal.]

Eric: No. Mid-segment is parallel to the base.

Charlie: I said mid-segment not diagonal was 10. But the area's 100!

Francesca: Why do you want the mid segment?

Geoff: 10 squared equals x squared + x squared, x squared times, 2 = 10 squared. 50 = x squared so the square root of 50, so about 7.07 for x. [As he speaks, Andrew writes: $10^2 = x^2 + x^2$ $10^2 = x^2 \times 2$ $50 = x^2$ $\sqrt{50} = x$ $7.07 = x$]

Andrew: And that's the length of each, right? [Points to the half diagonals.]

Hank: What are you doing that for?

Eric: Next find the height.

Geoff: YE is also 7.07.

Teacher: What might be a good idea to see what's going on? [Andrew labels each side with its length.] Now what?

Geoff: 7.07 × 7.07 = 49.849.

Hank: Got to be 50 man!

Irene: That's only half.

David: So you get 100?

Teacher: Is it close to 100?

Eric: It is 100.

Hank: Because those are rounded.

Teacher: Irene said double to get 100.

Hank: Two triangles.

Teacher: Why again?

Hank: Base times height divided by 2.

Teacher: And the same thing for each triangle. What do you think of Geoff's method?

Several: Too much algebra!

Others: Too much work.

Teacher: Why is this too much work? Is there an easier way?

Francesca: 10 by 10 because it's a square.

Jenny: Yes it's a square: 4 equal sides.

Kathy: Equal diagonals that's why.

Teachers: A parallelogram with equal diagonals is ...?

Hank: A square.

Teacher: Good job Andrew. Let's go to number three.

Note that eleven students participated, 6 boys and 5 girls, and that the role of teacher was that of facilitator, or guide. Note too that the students asked substantive questions of each other as they developed their understanding of the problem.

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item 14

set
number two 1994

Reading to Pre-schoolers
Models of Tutoring

Stuart McNaughton

Jennifer Lautusi

Reading to children at home is alive and well. This research found families in all socio-economic and cultural groups were reading to their children. But they do so in different styles, expect different outcomes, and reflect their own cultures.

A Samoan adolescent and an English girl reflect on different forms of expertise with books:

> Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice, 'without pictures or conversations?'
>
> *Alice's Adventures in Wonderland* by Lewis Carroll

> I am good at prayers because, since I was a tiny boy, my father he get me and my brothers and my sisters and my cousins for to learn how to make the prayers. He also get us for to read from the Holy Book until now I am sixteen years old and am an expert in the reading of the book.
>
> *Exam Failure Praying*, Albert Wendt, 1986, p.54

The family activity of reading books reveals a great deal about what matters to people. And so it also tells us about the education they seek. This ***set*** item is concerned with understanding how expertise in reading storybooks develops. It uses a contemporary psychological model of tutoring (scaffolding) and checks if this helps us understand what is really going on in different socio-cultural groups.

To give you the first conclusion first: some families in Aotearoa/New Zealand read storybooks with their preschoolers in ways that are at odds with the way the theories say are the most effective. They do not, of course, do this perversely, nor out of ignorance. They have different purposes for text than those who invented the theories. You can see that Alice expects to see pictures and hear talk in a narrative, but the 16-year-old Samoan boy in Albert Wendt's story takes pride in being an expert in 'the reading of the book.'

Storybook reading : tutors and scaffolds

Studies of how reading storybooks helps children's development have yielded two results. The first is that a standard tutorial pattern has been identified. The second is that not all socio-cultural groups use the tutorial pattern exactly the same way.

The standard description of interactions between readers and preschoolers goes back at least to work by Wood, Bruner and Ross in 1976. They described the tutor as providing **scaffolding**. That metaphor has been extensively applied and elaborated in further studies, particularly of the development of language and literacy.

In general, scaffolds are described as providing tutorial support which is adjustable and temporary. In the reading of storybooks with children at home the selection and use of storybooks themselves is a form of support. In addition, dynamic support has been seen in the conversations which are interspersed during the reading of the text. The reader structures the interactions using, and responding to, questions and comments. The function of this structuring is to yield conversational exchanges which are shared ways of constructing meanings from written narratives. The tutor models, directs and prompts.

The tutor adjusts his or her role according to the way the child develops meanings. Within repeated readings of books, and of different books, support for the child shifts. The tutor moves the responsibility for learning-how-to-interact-with-text from himself/herself, to the child. The expert (reader/tutor) is aware that the novice (child/learner), through personal constructive processes labelled 'internalization' or 'appropriation', is able to handle parts of reading on his or her own, and removes the scaffolding which is no longer necessary.

Scaffolds enable expert and novice, parent and child, to share commonly held ideas about what they are aiming to do; they know about each other's focus or intentions. This common goal can be seen developing in the negotiations during conversations and in the success of conversational exchanges.

Tutorials which 'scaffold' expertise in family language and literacy are said to be, 'engaging the learner in activities which are mature social and cultural uses of narrative texts.' This means that children are engaged in something that in itself is not isolated, fragmented and cut loose from everyday uses. The reading of storybooks is, in this way, like adult uses of written language. To concentrate on letter-sound associations, however, would not resemble the ordinary, adult, every-day use of books. An important feature is that scaffolds are socialization processes.

Tutorials which have these features are supposed to be effective for acquiring expertise in general, and particularly effective for the development of early literacy skills.

Storybook reading : differing socio-cultural settings

The details of the tutorial / scaffolding model come from intensive case studies and group studies, mostly of white middle-class families. This has led researchers to conclude that:

> Children almost never encounter an oral rendering of the text of the book in a storybook-reading situation. Instead, the words of the author are surrounded by the language of the adult reader and the child(ren) and the social interaction among them. During this interaction the participants co-operatively seek to negotiate meaning through verbal and nonverbal means.
>
> *Sulzby and Teale, 1991, p. 733*

Studies of low SES families in which storybook reading has been a regular family activity describe the interaction of adults and children as more restricted with a more limited focus on meanings and less co-operative dialogue. However, researchers who have deliberately introduced narrative texts into the literacy practices of black low SES families have noted the similarity between subsequent interactions and those in mainstream families.

Warning: there is a major assumption underlying these descriptions of tutoring and scaffolding and the research among low SES and black families: it is that *there is a right way to read storybooks to children*. This unacknowledged belief is that scaffolded storybook reading, with a focus on narrative meanings and presented in a collaborative style, is the appropriate and most effective way to socialize children into expertise with written language. What follows this assumption is the conclusion that those families who do not read with their children in this manner are socializing their children *inadequately*. This is supported by evidence which suggests that frequent storybook reading which uses the standard pattern is related to higher achievement levels in learning to read at school.

Three studies of storybook reading

At the end of this item we will return to discuss whether the underlying assumption is safe or dangerous. Before this, three studies of storybook reading in different families in Aotearoa / New Zealand are discussed. In these studies we have found the presence of substantially different patterns of tutoring and scaffolding. The extent and nature of those differences has caused us to question the usefulness of the standard model. A modified model of tutorial processes is proposed.

Study One (Phillips and McNaughton)

Ten families responded to advertisements in suburban libraries and bookshops for families interested in books and book reading. These families were Pakeha (Pakeha means people of European, particularly British descent). The incomes and occupations placed them in the top two SES groups in Aotearoa / New Zealand. In each family there were two adults and 1 or 2 children, and the mother was the major caregiver. The 6 boys and 4 girls were between 3 and 4½ years old.

The families read frequently – on average 3 books a day (87 in 28 days). Most of the books (95 percent) told a story. Both readers (predominantly the mothers) and the children initiated these sessions but it was usually the child who chose the book to be read.

After the first 28 days we introduced the family to books **we** chose. They were unfamiliar but similar to the ones they usually read. This enabled us to watch what was going on, particularly the tutorial processes, with standard texts.

Reading a book usually meant the parent reading the text, but not straight through: the reading was punctuated by verbal exchanges ('insertions'). Infrequently parents made verbal and non-verbal invitations to read and the child attempted to read. This occurred so infrequently that it was not included in the resulting analysis. We worked out what the goals of the reader and the child were by analysis of the *insertions*: there were several types.

Narrative insertions focused on information relevant to, or consistent with, the events and the goals of the narrative. In Example 1, the reader's comment in reference to an illustration 'Goodness! He's a big frog', and the child's question later, 'I wonder what those frogs are looking at him for?' are the beginning of a narrative insertion.

Example 1

Insertion with Narrative Focus

Text

In the dream time there lived a giant frog called Tiddalik. One morning when he awoke, he said to himself, 'I am so thirsty, I could drink a lake!' and that is what he did.

Initial Reading

Reader	Goodness! He's a big frog.
Child	And look at those little frogs.
Reader	Yes (laughing). They're all looking at him. Probably going, 'H-u-u-u. What an enormous one!'

Multiple Reading

Child	I wonder what those frogs are looking at him for?
Reader	Why do you think?
Child	I don't know.
Reader	What! Do you think they're a bit surprised at how large he is and what he's doing?
Child	I think... well, he's eating all their water.
Reader	Yes, I do too.

Print insertions focused on concepts about print including references to letters, words and pages as well as attributes of books and print. The reader saying, in Example 2, 'First you can show mummy where the front of the 'book' is?', begins a print insertion.

Other Book Insertions included questions and comments that were book related but not focused on the narrative or on concepts about print. There was an example during the same session as in Example 1 – a question about an illustration unrelated to the narrative: 'Mum, I run over to those trees?'

Example 2

Insertion with Print Focus

Reader	First you can show Mummy where the front of the book is? Show me where the front of the book is
Child	Yeah
Reader	The front, where's the front?
Child	Here
Reader	Okay. You turn the page. Where's the back of the book?
Child	Here
Reader	Where do you start reading? Which side? Which side do you start reading?
Child	This side
Reader	Which one?
Child	This side.
Reader	That's right. Oh! (page turned). This is where the story begins. "No more cakes." That's the... that's the name of the story.

Other Insertions were those insertions unrelated to book reading; typically to do with child management and interruptions to reading.

Results and analysis

Counting the insertions showed clearly that the focus for both the readers and the children was overwhelmingly on the narrative structure of the texts they read. Of the 647 insertions analysed, 86 percent of them were focused on the narrative.

The pattern of interaction between parent and child fits exactly the standard scaffolding model: reader and child collaborated in exchanges to construct meanings for the text. The preschooler participated as a full conversational partner in setting the topic.

Core features of the scaffolding model are found in Example 1. The child was engaged in a form of a mature task (reading for meanings) which was valued and functional in the family setting. Among other resources these families had on average over 450 adults' and children's books in the home, and the parents estimated that they spent over 2 hours in reading and writing activities per day.

The tutorial support was adjustable and temporary. In Example 1, the mother first focused the child's attention on the central narrative problem in the story: the giant frog has drunk all the water and the other animals have to find a way to get it back. By the last reading the child took responsibility for inserting dialogue at this point, also focusing on the problem. In the ensuing conversation the mother's part in the dialogue supports, through prompts, the child's articulation of the problem: 'I think... well... he's eating all their water.'

Quantitative analyses showed that in the first readings the adults concentrated on clarifying the narrative, and over time reduced their emphasis, as the children more often initiated this clarifying talk. The reader then shifted the focus towards making links with what was coming next. The children's self initiated questioning and checking showed the development of self regulation.

Study Two (McNaughton and Ka'ai)

A second study, involved families from different socio-cultural groups. Would the same tutorial/scaffolding model apply?

We began not by looking for families but by finding preschoolers who looked like becoming good readers at school. Older sisters and brothers helped find these children. Twelve families are described here. We audiotaped samples of books being read when the children were aged between three and four years. The families identified themselves as Maori (3), Pakeha (6) and Samoan (3). Maori, Samoan and Pakeha researchers worked with them. Incomes and occupations placed them in socioeconomic levels 4 and 5 (the New Zealand SES index has 6 levels). The families had two parents (and sometimes more adults from an extended family) and three or more children. The Samoan families were fully bilingual.

Reading and writing for a range of purposes were highly valued adult activities. Reading books was a daily occurrence. But in the majority of the Maori and Samoan households reading was typically done in groups of 3 or more, with other members of the family such as an older sibling or an auntie still at school often taking the role of reader. Eleven of the 12 families read story books. But in 7 families other books, including church texts, were selected more often for reading.

The standard tutorial pattern was present. The majority of insertions (60 percent of total insertions), and subsequent exchanges, had readers and children collaborating in constructing meanings from the text. But on some occasions a different form of interaction took place. These are a type of language routine which we called **performance routines**.

Performance routines occurred when part of the text was repeated by the child. On these occasions (16 percent of the insertions and routines) the reader indicated, through intonation patterns and pauses, that a model had been provided and the child's task was to imitate. These performance routines were even more noticeable on texts that were not storybooks. Examples of both types of interactions are shown in Example 3. They come from a book reading session in a Maori family. A storybook was read collaboratively (all 13 insertions had a narrative focus). However, a cousin's school book (a beginning reader) was read using performance routines on every line of text.

Example 3

Shifting tutorial styles in one book reading session by one family (child age 4:11)

(Book One – home storybook)

Text

Patch had been given the job of painting white lines for the running lanes.

Reader:	What are they doing there D...?
Child:	Painting... a line.
Reader:	So that they can run down the track straight

(Book Two – cousin's school book)

Text

Andrew had an engine called Red Streak.

Reader:	Andrew.
Child:	Andrew.
Reader:	had.
Child:	had.
Reader:	an engine.
Child:	an engine.
Reader:	called.
Child:	called.

When the readers and children were following *performance* routines the tutoring they gave did not have the characteristics of the standard scaffolding model. The focus was different: it was on accurate rendering of the text, and it was not obviously collaborative.

The *storybook* reading showed that these families, particularly the Maori and Samoan families, could read with textual dexterity. They could do it in ways recommended by schools as educationally sound. But they selected a wider range of books than the high SES families in the previous study and, most importantly, they could shift the way they interacted within and across texts.

Study Three (Wolfgramm)

This study is of a more homogeneous group of families. Eight Tongan families, permanent residents in New Zealand, who all attended one church, were contacted through personal networks. They identified their families as Tongan ('Mo'ui Fakatonga'). Their occupations placed them at level 4 and 5 on the New Zealand SES index. Adults other than parents, as well as nieces and nephews, lived in five households. There were 2 to 5 children in the families, one of whom in each family, a 3- or 4-year-old, was the focus of our attention.

Four families read daily with the pre-schooler. The other four families read three times a week. In four of the families one person consistently read, in the other families young aunts and older siblings also assumed the role. The book reading settings were all multiparty but with an adult caregiver present.

Example 4

Routines with a Performance Focus

Early Reading

Reader: Why hares have long ears.
Child: Why hares have long ears.
Reader: Once upon a time.
Child: Once upon a time.

Familiar Reading

Child: She is up on the tree.
She is up on the... (pause)
Reader: Stool.
Child: Stool.
She is up on the horse.

Multiple Reading

Child: One day mouse, rabbit and elephant went to the fair. Mouse went up, rabbit went up, elephant went up.

All 8 families read storybooks and in 5 families other books too. Five families supplied audiotapes in which at least two storybook readings occurred over a week. In one family there were no insertions or performance routines: the reader read without interruptions.

In four families, 3 'stages' of tutoring were observed; these employed only performance routines and are shown in Example 4. In the initial stage the reader demonstrated a part of the text and the child imitated. In the second stage children read much of the text by themselves and hesitations or misreadings were repaired by the reader. In the third stage the whole text was performed alone. There were examples from three families of preschoolers reading texts entirely by themselves.

What we learnt about performance tutorials and scaffolding

Some families in Aotearoa/New Zealand use a tutorial pattern which does not fit the standard scaffolding model. Some families practise this relatively exclusively. Others are pedagogically dexterous, shifting between two major forms, each of which appears to have distinct goals. If the 'mainstream' Pakeha children in Study 1 could be described as apprenticed to *comprehension*, then children in Studies 2 and 3 reading storybooks as a performance were apprenticed also to *verisimilitude*.

This non-standard tutorial is not simple: it shares most of the core features of other effective tutorials. For example, we saw very effective tutorial structures being created, structures which were both adjustable and temporary, as they should be. The support afforded by a complete demonstration of the text could be systematically reduced, (and re-applied if necessary) depending on the child's growing control over the text. As a consequence, responsibility for accurate performance shifted to the child. There was a shared focus with no confusion over what was expected, even by siblings and other family members. Some families (in the second study) could shift, seemingly with ease, between the two forms of tutorial.

However, it is more difficult to see 'self-regulation' developing during performance tutorials. In *mainstream* book reading, you hope to see checking, reflection and inquiry developing; these are not parts of the performance activity. As you become an expert performer you have to monitor yourself to prevent inaccuracy, but as a novice *performer* you have to limit creativeness.

Performance tutorials, pedagogy and culture

When the Study 3 children were learning to read out loud, accurately, through the teaching style and scaffolding we have called performance tutorials, they were busy with a mature task which both expressed cultural values and constructed cultural values. Cultural messages are, of course, multifaceted, and only limited observations can be made here. Similarly, there are important differences within families and between groups of families, and they can not be treated in depth here.

Authority

Under some conditions the performance tutorial form may be a preferred way of teaching for Maori. In times gone by rote learning and memorisation were key instructional devices, especially for the essential shared knowledge of the tribe contained in genealogies, songs and narratives.

> Maori puukenga (knowledgeable experts) set unfashionable store by memorisation and rote learning. Nowadays... these learning sessions follow a similar procedure, with variations, repeating each name or phrase a couple of times, adding the next, repeating again from the beginning, adding the next, repeating again, and so on to the end. Some 'teachers' using this method give little or no explanation of the content until the words have been mastered; others discuss meaning at intervals during the memorising, arguing that it is easier to remember what is understood. ... it is clear that rote learning is not

> an end in itself but the first step towards the goal of meaningful performance. ... knowing which to use and when, and that depends on knowing the background, being able to size up the situation, and to make the right choice
>
> *Metge, 1984*

In an oral culture the accuracy of oral texts and a stress on the preservation of knowledge are central concerns. It is also linked to a principle that knowledge is precious and to be treasured. This sense of guardianship and protection reinforces the value of representing knowledge accurately and without embellishment.

For Samoan families written texts reflect a set of values associated with the authority of church teachings and a strong respect for the church and for schooling. Early literacy experiences and resources are promoted and channelled by the pastor school (in Samoa) and by Sunday school sponsored activities in Aotearoa/New Zealand. The reading of texts also represents the authority of elders, and supports adherence to significant religious beliefs.

In daily reading from the Bible and family devotions (lotu) which are common in Samoan families can be seen the purposes of religious beliefs. But there are also others, including the cohesion of the family, and its commitment to shared beliefs, roles and responsibilities in the faa'samoa (the Samoan way). At a family's lotu there may be grandparents, parents, children and grandchildren. The performance tutorial is used when younger members are taught biblical passages. During lotu the leader (who reads first) has a position of prestige. Asking younger family members to take over the role of leading the devotion marks a stage in their lives but is also fulfilling the older members' responsibility for nurturing the younger ones (including aiding their reading development) and as a way of telling them that they are cared for.

The authority of texts and the presence of performance tutorials is associated with religious values in Tongan families too. For example, the performance tutorial is a standard form used in Sunday Schools to learn hymns and church texts. The Tongan children in Study 3 were observed learning hymns, bible verses and articles of faith at their Sunday School. Performance tutorials were used in these activities. A segment of one such tutorial, part way through the learning of a new hymn, is shown in Example 5.

Example 5

A segment from a Performance tutorial for learning a hymn in a Tongan Sunday school (from Wolfgramm, 1991)

Teacher	... Taha ... Hiva! [... One ... Sing!] (Pointing at the board)
Class	(The class sings the first line of the hymn)
Teacher	Toe ai ... Ua ... Hiva! [Again ... Two ... Sing!]
Class	(The class sings again the first line of the hymn)
Teacher	Sai ... [Good ...] (The teacher then sings second line of the hymn)
Teacher	A'i pe ia ... [Sing just that line ...]
Class	(The class sings the second line of the hymn)

The role of the individual

Important views of both *family roles* and *the nature of literacy* are seen in the way book reading sessions are carried out. All book reading in the Tongan families involved more than one other person. Older brothers and sisters, aunties and female cousins were part. By contrast, even though seven of the ten pakeha middle-class families in Study 1 had two or more children, only a third of the sessions in 28 days involved more than one reader and the preschooler. In all of the Maori and Samoan families in Study 2 there were examples of multiparty sessions while in only two of the pakeha families was this the case, despite there being older siblings.

Group learning is a preferred pedagogical mode for Maori. However, this does not exclude personal learning interactions; these can be seen occurring in group settings and shared activities. But the development of individual expertise carries responsibilities: for Maori, knowledge is a group possession, does not belong to the individual and is to be used in the service of the group. Part of whanaungatanga [familiness] is the relationship *tuakana-teina* — an older sibling or more expert member of the group takes responsibility for the needs of a younger or less expert member.

Similarly, in Samoan society older siblings and extended family are often expected to take immediate responsibility for looking after the needs of a younger child, at times instead of a parent. This carries meanings about the status of childrearers, reflecting values associated with the priority of familiness, including loyalty to the extended family unit.

In Tongan families similar principles are at work in who reads to the preschooler. In traditional society as soon as a child is weaned and becomes less reliant on his or her mother, older children in the family take charge. The value of this responsibility within the group is derived from the principle of 'Fatongia' (the Tongan way). Older extended family members have a role to care for the younger.

Is there a best way of reading with preschoolers?

As the examples have shown there is not one 'best' way. It depends what you are trying to do. Contrast these two: (1) the mainstream parent preparing the child for mainstream schooling and, along the way, instilling attitudes to life — an emphasis on independence and a personal focus. (2) the Tongan family preparing the child to take part in worship and, along the way, instilling attitudes to life — it is a family affair.

However, the tutorials and scaffolding for both cultures can be carried out with flair, or rather badly or somewhere in between. Different configurations will have their own internal criteria for effectiveness. Tutorials can be well or poorly implemented to achieve the purposes of the family's literacy practices and more general socialization goals. For example, the degree of overt collaboration and the coherence of the questions and comments in collaborative participation might determine the development of comprehension strategies for narrative texts. In directed performance tutorials the clarity and chunking of the model may determine the speed of acquisition of accurate performance.

Why has the view that the best sort of pre-school reading is reading-for-meaning-in-stories been so strongly supported? Literacy development often has been assumed to follow a fixed unitary sequence dictated by universal stages or constructed through a core set of concepts. In either case development is seen as moving inexorably towards a final state defined by *school* forms of literacy. Research evidence supports the argument that schema for narrative structures and comprehension strategies develop from collaborative participation. Limited storybook reading, as well as infrequent experience of collaborative participation in storybook reading, has been associated with problems in the development of literacy at school. For these sorts of reasons book reading experiences which are not like mainstream ways come to be seen (explicitly or implicitly) as non-functional or inadequate.

However, no child nowadays is taught in just one way — the family, the school, the television, and the sports club may all teach in different ways and all affect the child's development. Some forms of literacy certainly carry more 'cultural capital' in an educational system than others. For example, in Aotearoa/New Zealand, schools build upon expertise in reading texts for narrative meanings, rather than expertise in recitation. But as the Study 2 examples show, people can be at home in different cultures and literacies.

The challenge, given that it is important also to become expert in the comprehension and enquiry oriented literacy of the school, is to create bridges and foster dexterity. We need to recognise the strengths and capabilities of all children as they make the transition to school, and to build on these.

Notes

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The ideas and studies in this *set* item have been presented in several papers in journals and in particular in a paper presented at the Biennial Conference of the Society for Research in Child Development, New Orleans, March 1993. They are also to appear in more detail in the forthcoming book

Kohl de Oliviera, M. and Valsiner, J. (Eds.)(1994) *Literacy in Human Development*. Norwood, NJ: Ablex.

The author would like to acknowledge, with thanks, the families with whom the researchers worked, and the New Zealand Ministry of Education which funded some of the research.

The two quotations at the beginning are from

Carroll, L. (1986) *The complete illustrated works of Lewis Carroll.* London: Chancellor Press, page 17.

Wendt, A. (1986) Exam Failure Praying. In *The birth and death of the miracle man: a collection of short stories.* New York: Viking, p 54.

That not all socio-social groups use the tutorial pattern in exactly the same way is noted in

Sulzby, E. and Teale, W. (1991) Emergent literacy. In R. Barr (Ed.) *Handbook of reading research. Vol. 2.* New York: Longman.

The standard description of interactions between readers and preschoolers goes back at least to

Wood, D., Bruner, J. and Ross, G. (1976) The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry.* Vol. 17, pp. 89-100.

Elaboration of the scaffolding metaphor can be found in

Cazden, C. (1988) *Classroom discourse.* Portsmouth, NH: Heinemann.

and

Rogoff, B. (1990) *Apprenticeship in thinking: cognitive development in social context.* Oxford: Oxford University Press.

and

Wood, D. (1989) *How children think and learn.* London: Basil Blackwell.

For the ideas of internalisation and appropriation see Rogoff, above.

That tutorials, as first described, are supposed to be effective in acquiring expertise, particularly in literacy, is maintained in Cazden, Rogoff, Sulzby & Teale, Wood, above, and also

Tharp, R. & Gallimore, R. (1988) *Rousing minds to life: teaching, learning and schooling in social context.* NY: Cambridge U. Press.

A study of low SES families with more restricted interaction is, for example,

Heath, S.B. (1982) What no bedtime story means: Narrative skills at home and at school. *Language in Society.* Vol. 11, pp. 49-76.

Note, however, that in one study co-operative exchanges were infrequent. See

Pellegrini, A.D., Perlmutter, J.C., Galda, L. and Brody, G.H. (1990) Joint book reading between black Head Start children and their mothers. *Child Development.* Vol. 61, pp. 443-453.

The evidence that frequent storybook reading following the standard pattern is related to higher achievement levels can be found in Sulzby and Teale, referenced above.

Study 1 can be found described in detail in

Phillips, G. and McNaughton, S. (1990) The practice of storybook reading to preschool children in mainstream New Zealand families. *Reading Research Quarterly.* Vol. 25, No. 3, pp. 196-212.

Study 2 can be found described in more detail in

McNaughton, S. and Ka'ai, T. (1990) Two studies of transitions: socializations of literacy and Te hiringa take take: Mai i Te Kohanga Reo ki te kura. Report to the New Zealand Ministry of Education.

Study 3 can be found described in more detail in

Wolfgramm, E. (1991) Becoming literate: The activity of book reading to Tongan preschoolers in Auckland. Unpublished Master of Arts thesis, University of Auckland.

That performance tutorials may be preferred by Maori as a way of teaching is explained in, and the quotation is from

Metge, J. (1984) *Learning and teaching: he tikanga Maori.* Wellington: New Zealand Department of Education.

That in Samoan culture the reading of text represents the authority of the elders and supports religious beliefs is discussed in

Duranti, A. and Ochs, E. (1986) Literacy instruction in a Samoan village. In B.B. Schieffelin and P. Gilmore (Eds.) *The acquisition of literacy: ethnographic perspectives.* Norwood, NJ: Ablex.

A description of a family lotu can be found in

McNaughton, S. (In press) *Patterns of emergent literacy: processes of development and transition.* Oxford University Press.

The *tuakana-teina* relationship is explained more fully in

Hohepa, M., Smith, G.H., Smith, L.T. and McNaughton, S. (1992) Te Kohanga Reo hei tikanga ako i te Reo Maori: Te Kohanga Reo as a context for language learning. *Educational Psychology.* Vol. 12, Nos. 3 and 4, pp. 323-346.

Tutorial styles are discussed in detail by Sulzby & Teale, referenced above, and an interesting study of teaching in Quranic schools in Morocco is found in

Wagner, D.A. and Spratt, J.E. (1987) Cognitive consequences of contrasting pedagogies: The effects of Quranic pre-schooling in Morocco. *Child Development.* Vol. 58, pp. 1207-1219.

The idea that literacy develops in a unitary sequence with universal stages, or through a core set of concepts can be found in

Goodman, Y. (1990) *How children construct literacy.* Newark: International Reading Association.

and

Mason, J.M. and Allen, J. (1986) A review of emergent literacy with implications for research and practice in reading. In E.Z. Rothkopf (Ed.) *Review of research in education, Vol. 13.* Washington: American Educational Research Association.

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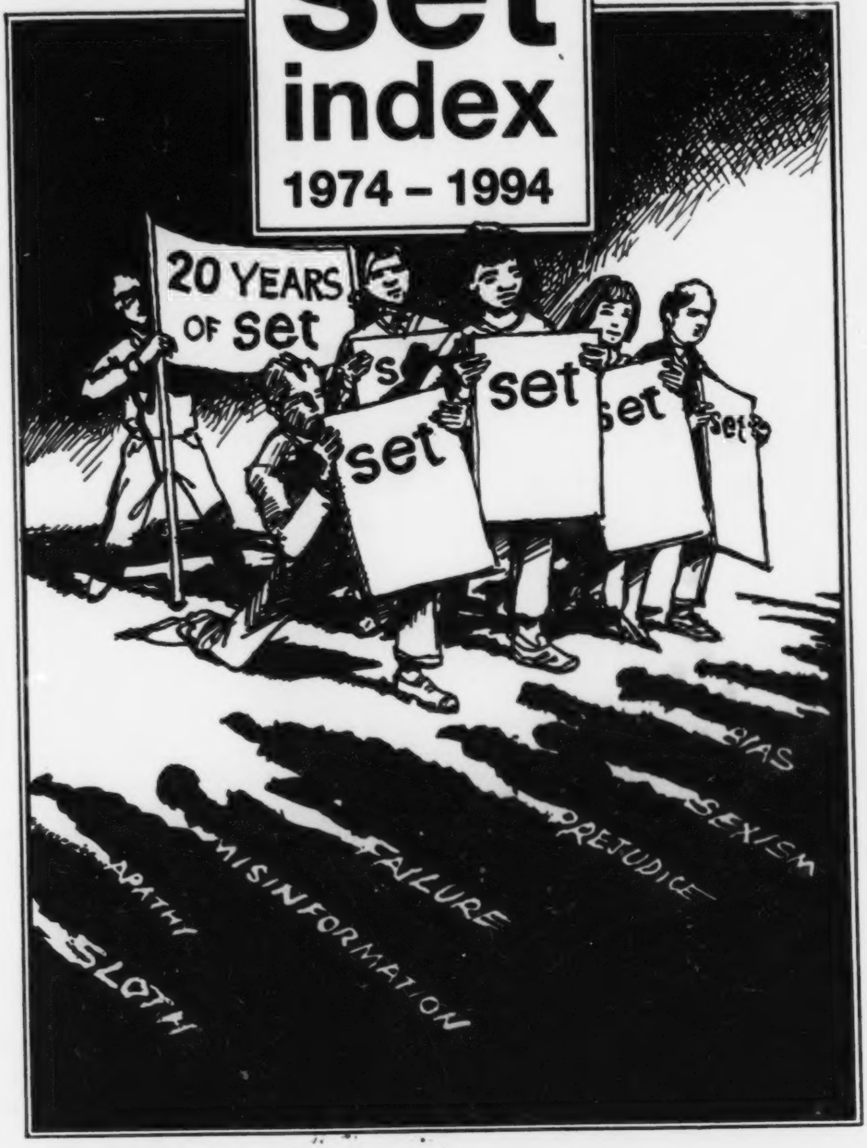
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New Zealand Council for Educational Research, Wellington

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Introduction

This cumulative Index indexes all items published in ***set**: Research Information for Teachers* from 1974 to 1994. The Index contains three main sections.

Author Index:
This index provides access to the entries by personal and corporate authors, institutions, and names of research projects. The numbering refers to the entry numbers in the Main Entry Section.

Subject Index:
Each entry has been assigned subject descriptors from the Thesaurus of ERIC Descriptors, eleventh edition, 1987. Some changes have been made, however, so that terms are consistent with Australian and New Zealand usage. These changes include: 'Primary Education' instead of 'Elementary Education'; the terms 'Maori', 'Maori Education' and 'Aboriginal Education', in a similar way to 'Blacks' and 'Black Education'; 'University Students' etc., instead of 'College Students'. Identifying terms for subjects not covered by the ERIC Thesaurus are used occasionally, e.g.,'Playcentre', 'Progressive Achievement Tests', 'Whanau House'. The numbering refers to the entry numbers in the Main Entry Section.

Main Entry Section:
Entries are grouped in numerical order, starting with the first item published in ***set*** 74 no.1. Each entry has been assigned a number, for the purposes of this Index; this number is unique to the entry. Some items, published twice in, for example, a regular edition and a *Best of **set***, will have two numbers for what is essentially the same item. Cross references are provided. All special issues, for example the *Early Childhood Folios* and the *Best of **set*** issues, will be found among the ordinary issues; in these entries the item numbers have the suffix 's' to help identify them in the Author and Subject indexes.

Where New Zealand and Australian editions (1979 to 1986) have items unique to each edition, the uniquely Australian items have the suffix 'a'.

Items available

The complete run of ***set**: Research Information for Teachers* is available in the New Zealand Council for Educational Research library, and the Australian Council for Educational Research library. Requests for items may be sent through library interloan systems. Requests for items on specific topics should be made through the Information Services of either Council; however, check whether the topic has been dealt with in a *Best of **set***. For example, testing and assessment in *Best of **set**: Assessment* and preschool topics in an *Early Childhood Folio*; items in these special editions may be what you want; they are available as separate publications.

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1 Research Information and Test Advisory Services.
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2 Hilsum, S.
The teacher at work.
set *74, no.1, item b (Research briefs)*
Summary of an NFER survey on how the primary school teacher spends the day.

3 Donnison, D. (ed)
A pattern of disadvantage.
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Summary of commentary on the implications of the report of the National Child Development study *From Birth to Seven.*

4 Rowell, J.A. and Selge, H.
An investigation of the effects of different rates and methods of promotion from infant grades on the subsequent performances of children in South Australian schools.
set *74, no.1, item b (Research briefs)*
Summary of report.

5 Stafford, R.E.
Hereditary and environmental components of quantitative reasoning.
set *74, no.1, item b (Research briefs)*
Summary of review of studies of whether mathematical ability is inborn or learned.

6 Smith, C.B., Carter, B. and Dapper, G.
Reading and the home environment: the principal's responsibility.
set *74, no.1, item b (Research briefs)*
Summary of a report on a number of American action research programmes designed to overcome environmental deficiencies that inhibit reading skill.

7 Joseph, A. and Parfit, J.
Playgroups in an area of social need.
set *74, no.1, item b (Research briefs)*
Summary of a study of playgroups in a socially deprived area of London.

8 Parfit, J.
The Halsey report on educational priority and the pre-school child.
set *74, no.1, item b (Research briefs)*
Summary of the research with regard to preschool children, reported in Educational Priority: EPA Problems and Policies, Vol.1, edited by A.H. Halsey, London: HMSO, 1972.

9 Jobling, M.
Children of working mothers: an abstract of research findings.
set *74, no.1, item b (Research briefs)*

10 Natale, S.
An experiment in empathy.
set *74, no.1, item b (Research briefs)*
A summary of the study, published Slough: NFER, 1972.

11 Hastings Art and Craft Workshop
set *74, no.1, item c (Research from the regions).*
An outline of an art workshop programme for gifted children.

12 Identification of gifted children.
set *74, no.1, item c (Research from the regions).*
Description of enrichment course for very gifted children in Israel.

13 May, J.M.
Research on school libraries.
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14 Research project file.
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15 Panckhurst, F.
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16 Panckhurst, F.
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***set** 74, no.1, item e (Learning through discussion: 1).*

17 Learning through discussion: 2.
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18 Freire, P.
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***set** 74, no.1, item g (Learning through discussion: 3).*
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19 'Future' studies
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20 Holt, J.
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***set** 74, no.1, item h (Learning through discussion: 4).*
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21 From a videotape recording.
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Excerpt from a videotape recording of a lesson.

22 Form 1 language lesson.
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23 Bossing, N.L.
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24 Shadbolt, T.
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25 Baxter, J.K.
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26 Present teaching methods seen to be mechanical.
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27 Simons, H.
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***set** 74, no.1, item j (Learning through discussion: 6).*
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28 New Zealand Post-Primary Teachers' Association. Curriculum Review Group.
Education in change: report of the Curriculum Review Group.
***set** no.1, 1974, item j (Learning through discussion: 6).*
Inquiry and discussion in the classroom and the teacher's role: an excerpt from the report.

29 Fiddling, C.
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30 Bligh, D.A.
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***set** 74, no.1, item j (Learning through discussion: 6).*
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31 Teachers plan for changes.
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32 Films on discussion.
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Annotated list of seven 16mm films on discussion available from the National Film Library.

33 Edwards, T. and Webb, D.
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Results of a questionnaire of 6th form students.

34 Lee, J.A.
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35 Hyde, R. (i.e. Wilkinson, I.)
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36 Blishen, E. (ed)
The school that I'd like.
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37 Chapman-Taylor, R. and Clark, H.V.
The liberation of the mind.
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38 Bream, F.
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39 State Services Commission.
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40 Understanding discussion in the classroom.
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41 Simons, H.
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42 Abercombie, M.L.J.
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43 Research information.
set 74, no.2, item 1.
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44 Alternative education: what choice or difference?
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Summary of publication by Fitzgerald, R.T., Matthews, J.K. and Thomson, P.P.

45 Learning to read with television: research in Britain.
set 74, no.2, item 2 (Research briefs).
Outlining British experiments in using television to help retarded readers.

46 Learning to read with television: The Electric Company.

set *74, no.2, item 2 (Research briefs).*
An independent evaluation of a television reading programme in the US.

47 The integration of handicapped pupils in the school class.
set *74, no.2, item 2 (Research briefs).*
Summary of report studying the effects of integration in Sweden.

48 Parents' and teachers' views on special classes for backward children.
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49 Special class placement and children's social adjustment.
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50 Ouston, J.
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51 Ill-treatment of children in New Zealand.
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A summary of reports by the Department of Social Welfare.

52 School counsellors influenced by child's social background.
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53 Structural apparatus may develop spatial ability.
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54 What worries university students?
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55 Changing teacher behaviour.
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A comparison of microteaching and cognitive discrimination training.

56 Teaching under the influence of programmed instruction techniques.
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57 Sex stereotypes in children's readers.
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58 New Zealand research on the open planned classroom.
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59 Schools Council.
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60 Human development and relationships in the school curriculum.
set *74, no.2, item 5 (Research project file).*

61 Moral education in Ontario.
set *74, no.2, item 5 (Research project).*
Description of a study in a Canadian secondary school.

62 NZCER project profile.
set *74, no.2, item 5 (Research project file).*
Description of a long-term follow-up of the 1955 cohort of entrants to university in New Zealand, to investigate their subsequent university performance and occupational history.

63 Smith, G.C.
Too great a risk!
set *74, no.2, item 6.*
A comic strip pamphlet of contraception advice and information for young people.

64 Moral development: an introduction to some research.
set *74, no.2, item 7 (Moral development: 1).*

65 Lifeline: moral education project.
set *74, no.2, item 8.*
A Schools Council project.

66 Moral development: 2.
set *74, no.2, item 9.*
Selection of excerpts illustrating aspects of moral development and social attitudes.

67 Cowie, C.
Test information.
set *74, no.2, item 10.*
Bulletin on aspects of evaluation, measurement, and testing.

set 75, number 1

68 Cowie, C.
Test information: PAT: mathematics; what can be done with the results?
set *75, no.1, item 2.*
An outline of the purpose and use of Progressive Achievement Tests.

69 Elley, W.B. and Livingstone, I.D.
What can research tell us about secondary school examinations?
set *75, no.1, item 3.*
Outline of research in NZ into teachers' attitudes to internal assessment and methods of testing.

70 McDonald, G.
Early childhood research in New Zealand.
set *75, no.1, item 4.*

71 Church, J.
Could teachers be doing worthwhile research?
set *75, no.1, item 5.*

72 Adams, R.S.
Big school versus small school.
set *75, no.1, item 6.*
Research studies on school size.

73 **Are small classes better than big classes?**
set *75, no.1, item 6.*

74 **Teachers' attitudes on class size.**
set *75, no.1, item. 6.*

75 Teaching language through television.
set *75, no.1, item 7 (Research briefs).*
Research on the classroom use of television for teaching English to immigrant children.

76 Non-standard English and comprehension.
set *75, no.1, item 7 (Research briefs).*
Summary of local and overseas research into the use of dialects.

77 Does instruction in English grammar improve writing skills?
set *75, no.1, item 7 (Research briefs).*
Results of a three-year study in a secondary school.

78 Foreign language teaching in primary schools.
set *75, no.1, item 7 (Research briefs).*
From a ten year study on teaching French in British primary schools.

79 When should they learn to read?
set *75, no.1, item 7 (Research briefs).*

80 Cowie, C.
Parental involvement in schools.
set *75, no.1, item 8.*

81 Scarfe, N.V.
Can you teach hostile students?
set *75, no.1, item 9.*
Discipline problems in classrooms, and the reasons for them.

82 Rolfe, E.
Assessment of spoken English.
set *75, no.1, item 10.*

83 Scott, T.
An early Wellington kindergarten.
set *75, no.1, item 11.*
A personal account of the history of early childhood education in Wellington, described by T. Scott, compiled by McDonald, G.

set 75, number 2 was not published

set 76, number 1

84 National Children's Bureau
set *76, no.1, item 1.*
Outline of the Bureau's research projects, services and publications.

85 Tagg, M.
Slow learner education in New Zealand.
set *76, no.1, item 2.*
Results of a survey in some New Zealand secondary schools.

86 Jobling, M.
The bereaved child.
set *76, no.1, item 3 (Research briefs).*
Research findings of the effect of death on children.

87 Children in traffic.
set *76, no.1, item 4 (Research briefs).*
Research into the effectiveness of road safety programmes for children.

88 Elley, W.B.
What does boarding school do to a boy?
***set** 76, no.1, item 5.*

89 Carnegie Quarterly
Can children make a comeback after a poor start?
***set** 76, no.1, item 6.*
The importance of environment on cognitive development.

90 Reid, N.
Gifted children: do we deserve them?
***set** 76, no.1, item 7.*

91 Renzulli, J.S. and Hartman, R.K.
Scale for rating behavioral characteristics of superior students.
***set** 76, no.1, item 8.*

92 Irving, J.
Attainment and adjustment in adolescence: co-educational or single-sex schools?: a review of the literature.
***set** 76, no.1, item 9.*

93 Elley, W.B.
Children: television: violence: research on the effects of television on children's behaviour: a review.
***set** 76, no.1, item 10.*

94 Watson, J. and MacArthur, B.
Children at risk: multi-disciplinary research in Auckland.
***set** 76, no.1, item 11.*
An outline of co-operative research, medical and educational in Auckland, NZ.

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set 76, number 2

95 Teaching poetry: what kind of poems do children like?
***set** 76, no.2, item 2.*

96 New Zealand Book Council.
A library exhibition of New Zealand poetry.
***set** 76, no.2 (bonus item with item 2).*

97 Learning a second language vocabulary.
***set** 76, no.2, item 3 (Research brief).*
On the keyword method of learning new words in another language.

98 Rewards and motivation.
***set** 76, no.2, item 4 (Research brief)*
A report of studies showing how the use of external rewards can lessen the intrinsic interest a child may have in an activity.

99 The examination game.
***set** 76, no.2, item 5 (Research brief).*
How students prepare for examinations.

100 Team teaching.
***set** 76, no.2, item 6 (Research brief).*
Report of a study in primary and secondary schools in the UK.

101 A language for life: the Bullock report.
***set** 76, no.2, item 7.*
Outline of the Bullock report on English teaching and learning in the UK.

102 Beckingham, M.
Corporal punishment: are there effective alternatives?
***set** 76, no.2, item 8.*

103 A parable for our times.
***set** 76, no.2, item 9.*
A humorous allegory.

104 Cowie, C.
Intelligence and intelligence testing.
***set** 76, no.2, item 10.*

105 Barney, D.
Why are some New Zealand kindergartens so noisy?
***set** 76, no.2, item 11 (The preschool environment).*

106 Day, D.E. and Sheehan, R.
Is open space just empty space?
***set** 76, no.2, item 11 (The preschool environment).*
A study on the physical environment in preschools and effects on children's behaviour.

107 Barney, D.
Stand-off and watch.
***set** 76, no.2, item 11 (The preschool environment).*
An outline of observation techniques related to area use in kindergartens.

108 Cannon, R.
Individualized learning: an

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introduction.
set *76, no.2, item 12.*

109 Croft, C.
How are our skools teaching speling? the teaching of spelling in New Zealand schools: report of a national survey.
set *76, no.2, item 13.*

110 Elley, W.B.
To stream or not to stream?: research on streaming.
set *76, no.2, item 14.*

111 Pickens, K.A.
Open plan: who benefits?: recent research on open plan classrooms.
set *76, no.2, item 15.*

112 Pickens, K.A.
Teaching about drugs: research on the effects of drug education programmes.
set *76, no.2, item 16.*

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113 Elley, W.B.
A close look at the Cloze test in assessing readability.
set *77, no.1, item 2.*

114 McDonald, G.
Maternal deprivation: fact or fallacy?
set *77, no.1, item 3.*

115 Benton, R.
Is bilingualism a handicap?
set *77, no.1, item 4.*

116 Jamieson, P.
Second language education of young children.
set *77, no.1, item 5.*
Acquisition of English as a second language by Tokelau children in NZ.

117 ACER (Australian Council for Educational Research)
set *77, no.1, item 6.*
Outline of the activities of ACER.

118 McDonald, G.
Structured language programmes for pre-school children.
set *77, no.1, item 7.*
Discussion of theories that disadvantaged children need language programmes.

119 Hawkins, P.
Language and social class.
set *77, no.1, item 8.*
Research on social class differences and children's speech and language.

120 Children of working mothers.
set *77, no.1, item 9 (Research briefs).*

121 School and community.
set *77, no.1, item 10 (Research briefs).*
Results of a study of five Australian secondary schools and their relationships with the local community.

122 Pluckrose, H.
The development of meaning.
set *77, no.1, item 11 (Research briefs).*
An investigation into children's use of language and its implications for learning.

123 The father's role.
set *77, no.1, item 12 (Research briefs).*
Review of research on the father's role in child development.

124 Cowie, C.
Using the essay as an assessment technique.
set *77, no.1, item 13 (Test information).*

125 Havighurst, R.J.
Human characteristics and school learning.
set *77, no.1, item 14 (set review)*
Review of Bloom, B. *Human characteristics and school learning.*

set 77, number 2

126 Renwick, M.
TV and five year olds: the teacher's view.
set *77, no.2, item 2.*

127 Bancroft, D.
A second language: an outward-looking balance?
set *77, no.2, item 3.*
Results of a survey concerning the learning and teaching of foreign languages in NZ schools.

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128 Walsh, D.
Behaviour modification for citizens and academicians.
set *77, no.2, item 4.*

129 Evans, E.G.S.
Behaviour problems in children.
set *77, no.2, item 5 (set review).*
Recent research on behaviour problems and the use of behaviour modification techniques.

130 Cowie, C.
Diagnostic tests of reading: their place in the diagnostic process.
set *77, no.2, item 6 (Test information).*

131 Watson, J.
Educational research in the South Pacific: unpublished dissertations and theses.
set *77, no.2, item 7.*

132 Clark, M.
Do primary school children appreciate mathematics?
set *77, no.2, item 8.*

133 Keen, D.
The condition of history in our secondary schools.
set *77, no.2, item 9.*

134 Hart, S.
Sex roles and sex differences.
set *77, no.2, item 10 (Research briefs).*

135 The family with a handicapped child.
set *77, no.2, item 11 (Research briefs).*

136 The effects of family size and birth order on child development.
set *77, no.2, item 12 (Research briefs).*

137 Wilby, P.
Schools can help pupils?
set *77, no.2, item 13 (Research briefs).*
Report of a British study indicating that schools can contribute to pupil achievement.

138 An act to make further provision for the education of the people of New Zealand.
set *77, no.2, item 14.*
Extracts from The Education Act, 1877 dealing with the Department of Education, the appointment of teachers, and public schools.

139 Regulations defining standards of education, and for inspection of schools.
set *77, no.2, item 15.*

140 Reid, N.
PAT: study skills tests.
set *77, no.2, item 16 (Test information).*
Description of the study skills tests in the Progressive Achievement Test (PAT) series.

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set 78, number 1

141 Orange, R.
Vertical grouping in New Zealand secondary schools.
set *78, no.1, item 2.*

142 Fitzgerald, T.
The eating habits of New Zealand school children.
set *78, no.1, item 3.*

143 Marsh, R.
Language and behaviour.
set *78, no.1, item 4.*
An interpretation of the development of language and its impact on behaviour.

144 Hawkins, P.
The pronunciation of English in New Zealand.
set *78, no.1, item 5.*

145 Early childhood education in New Zealand: recent work.
set *78, no.1, item 6.*
Studies in progress, conference papers and bibliographies.

146 Find the moral.
set *78, no.1, item 7.*
A humorous allegory.

147 Walsh, D.
Specific learning disability: definitions.
set *78, no.1, item 8.*

148 Makins, V.
In the real world you can't say cereal when you mean shampoo.
set *78, no.1, item 9 (Reading: Smith's Rule, McAndrew's Ploy, Bedwell's Condition).*
A review of a study of how children

learn to read.

149 Brooks, A.
Reading through the little screen.
set 78, no.1, item 9 (Reading: Smith's Rule, McAndrew's Ploy, Bedwell's Condition).
An outline of TV-related reading programmes.

150 Makins, V.
Can't read?: maybe they can't see.
set 78, no.1, item 9 (Reading: Smith's Rule, McAndrew's Ploy, Bedwell's Condition).
Results of British research into vision problems and reading.

151 Croft, C.
Assessing the worth of instructional materials.
set 78, no.1, item 10.

152 Family day-care.
set 78, no.1, item 11 (Research briefs).

153 Bush, S.
Predicting and preventing child abuse.
set 78, no.1, item 12 (Research briefs).

154 Reid, N.
Standards, basics and national assessment.
set 78, no.1, item 13.
A summary of research on New Zealand's national standards of education and evaluation methods.

155 Hewitson, M.
Teaching styles and pupil progress: what the book says.
set 78, no.1, item 14 (set piece).
A summary of Bennett, N. et al, *Teaching styles and pupil progress.*

156 Jackson, P.
Teaching styles and pupil progress: what the critics say.
set 78, no.1, item 15.
A summary and evaluation of the criticisms made of Bennett, N. et al, *Teaching styles and pupil progress.*

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set 78, number 2

157 Gifted children: a radio programme.
set 78, no.2, item 2 (Gifted children: the school situation).
Transcript of a radio programme produced by the Hamilton Branch of the New Zealand Association for Gifted Children.

158 One family's experience.
set 78, no.2, item 2 (Gifted children: the school situation).
Provisions made by schools for one gifted child.

159 Hill, C.G.N.
To school or not to school?
set 78, no.2, item 2 (Gifted children: the school situation).
Two case studies of gifted children taught at home and at school.

160 Pickens, K. and Routledge, M.
Perspective.
set 78, no.2, item 3 (Deciding about drugs).
Brief summary of the state of the art in school drug education.

161 Dorn, N.
The DEDE Project: an experimental project in situational education for decision-making skills.
set 78, no.2, item 3 (Deciding about drugs).

162 Children: violent families: emotional development.
set 78, no.2, item 4 (Research brief).

163 Anderson, L.S.
The aggressive child.
set 78, no.2, item 5.

164 Violent and disruptive pupils: school vandalism.
set 78, no.2, item 6.

165 Rosenberg, G.
Adolescent needs in the urban environment.
set 78, no.2, item 7.

166 Meade, A.
Pre-school volunteers.
set 78, no.2, item 8.
Parent involvement in preschool education.

167 Children with spina bifida.
set 78, no.2, item 9 (Research brief).

168 Jackson, P.
The SHEIK: the Study Habits

Evaluation and Instruction Kit.
***set** 78, no.2, item 10.*

169 Reid, N.
Is anyone listening?
***set** 78, no.2, item 11.*
Steps teachers can take to help their pupils develop listening skills.

170 Malcolm, M.S.
The almost invisible woman.
***set** 78, no.2, item 12.*
A look at the domination of school administration by men.

171 Children in hospital.
***set** 78, no.2, item 13 (Research briefs).*

172 Walsh, D.
Specific learning disability.
***set** 78, no.2, item 14.*

173 Croft, C.
Spelling achievement: weighing the research.
***set** 78, no.2, item 15.*

174 McAlpine, R.
Fifth formers: English teachers: poetry.
***set** 78, no.2, item 16.*
Results of a study of the attitudes of teachers and students to poetry in the school curriculum.

175 Watson, J.
New Zealand research on the arts in education: unpublished dissertations and theses: chronological lists.
***set** 78, no.2, item 17.*

176 Renwick, M.
Going to school: a guide for parents.
***set** 78, no.2 (bonus item).*

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177 United Nations Declaration of Children's Rights.
***set** no.1, 1979, item 2.*

178 Jackson, P., Reid, N., Croft, C. and Cowie, C.
FOSSIC: a study skills rating schedule.
***set** no.1, 1979, item 3.*

179 McDonald, G.
Working with Pacific Island and Maori parents.
***set** no.1, 1979, item 4.*
A discussion of problems of communication between teachers and parents from different cultural groups.

180 Walsh, D.
TV and reading.
***set** no.1, 1979, item 5.*

181 Benton, R.A.
Who speaks Maori in New Zealand?
***set** no.1, 1979, item 6.*

182 Thompson, P.
Forms of assessment in secondary schools.
***set** no.1, 1979, item 7.*

183 Dodson, C.
Bilingual education: teaching children in two languages.
***set** no.1, 1979, item 8.*
The Welsh experience in bilingual education as it applies to New Zealand.

184 Wragg, E.C.
A suitable case for imitation.
***set** no.1, 1979, item 9.*
A teacher who uses informal methods obtains surprisingly high learning gains for her children.

185 Ranby, P.
What do Maori children think of themselves?
***set** no.1, 1979, item 10.*
Survey of the self-concept of Maori pupils in New Zealand secondary schools.

186 Youth unemployment: a review of the situation in NZ.
***set** no.1, 1979, item 11 (From school to what?).*

187 Cameron, C. and Livingstone, I.
One hundred early school leavers.
***set** no.1, 1979, item 11 (From school to what?).*
Longitudinal study of the vocational plans of early school leavers, and how they coped with the transition and adjustment to work.

188 Norman, H.
Job scarcity in the Bay of Plenty; a

survey of school leavers in the Rotorua/Bay of Plenty area and a follow-up sample of those leavers one year later.
set *no.1, 1979, item 11 (From school to what?).*

189 Coping when you leave: a teaching programme for secondary school pupils.
set *no.1, 1979, item 11 (From school to what?).*

190 Cameron, C.
Research your school's vocational education effectiveness.
set *no.1, 1979, item 12.*
A questionnaire prepared for school leavers who obtained jobs.

191 Jamieson, P.
Who doesn't get to pre-school in Newtown?
set *no.1, 1979, item 13.*

192 set index, 1974-1978
set *no.1, 1979, item 14.*
An author and subject index of items published in set, 1974-1978.

193 Routledge, M.
Young people and alcohol; a summary report.
set *no.1, 1979, bonus item.*

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set number 2, 1979

194 Penton, J.
Reading in NZ schools: a survey of our theory and practice.
set *no.2, 1979, item 2.*

195 Robinson, V., Glynn, T., McNaughton, S. and Quinn, M.
Parents as remedial reading tutors: a report on the work of the Mangere Home and School Project.
set *no.2, 1979, item 3.*

196 Nicholson, T.
Putting the answer before the question: a new way of understanding reading comprehension.
set *no.2, 1979, item 4.*

197 Legibility.
set *no.2, 1979, item 5.*

198 Johnson, B.
Assessing attitudes to reading: what can teachers do?
set *no.2, 1979, item 6.*

199 Pickens, K.
What to do while waiting for the reading adviser to arrive.
set *no.2, 1979, item 7.*
List of journals on reading.

200 Bowler, P.
The decline in jumping standards.
set *no.2, 1979, item 8.*
A humorous allegory.

201 Somerville, R. and Chapman, E.
Adult reading assistance.
set *no.2, 1979, item 9.*
Description of the development of the community-based Adult Reading Assistance Schemes in New Zealand.

202 Reid, N.
'Go and look it up yourself': developing study skills in primary and secondary schools.
set *no.2, 1979, item 10.*

203 Carnegie Quarterly.
New optimism about pre-school education: three reports from Ypsilanti, Michigan.
set *no.2, 1979, item 11.*
Results of studies showing that pre-school education may be an effective means of helping educationally disadvantaged children.

204 Bronfenbrenner, U.
Who cares for children?
set *no.2, 1979, item 12.*
An address showing how family change has affected child care.

205 Jackson, P.
Sources of satisfaction: school subjects and what secondary school students think of them.
set *no.2, 1979, item 13.*

206 Thomas, D.R.
Social behaviour and classroom learning: Polynesian and Pakeha.
set *no.2, 1979, item 14.*
Describes how studies of social

behaviour (particularly co-operation and competition) can be used by teachers to overcome problems in multi-cultural classrooms.

207 Lavo, B.
Teacher stress; an annotated bibliography.
set *no.2, 1979, item 15.*

208 Glynn, T., McNaughton, S., Robinson, V. and Quinn, M.
Remedial reading at home: helping you to help your child.
set *no.2, 1979, bonus item.*

Special Issue

(First Australian edition – past New Zealand items reprinted.)

195a Elley, W.
A close look at the Cloze test.
set *special issue, 1979, item 2; previously published in New Zealand* ***set*** *77, no.1, item 2; see entry 113.*
A practical test for teachers to assess the readability of textbooks and their own written lessons.

196a
Find the moral.
set *special issue 1979, item 3, previously published in* ***set*** *78, no.1; item 7; see entry 146.*
A humorous allegory.

197a Thomson, P.
Forms of assessment in secondary schools.
set *special issue 1979, item 3, previously published in* ***set*** *no.1, 1979, item 7; see entry 182.*

198a Marsh, R.
Language and behaviour.
set *special issue, 1979, item 4; previously published in* ***set*** *78, no.1, item 4; see entry 143.*
An interpretation of the development of language and its impact on behaviour.

199a Violent and discruptive pupils: school vandalism.
set *special issue, 1979, item 5; previously published in* ***set*** *78, no.2, item 5; see entry 164.*

200a Reid, N.
Gifted children: do we deserve them?
set *special issue, 1979, item 5; previously published in* ***set*** *76, no.1, item 7; see entry 90.*

201a Walsh, D.
Specific learning disability: definitions.
set *special issue, 1979, item 7; previously published in* ***set*** *78, no.1, item 8; see entry 147.*

202a Pickens, K.A.
Open plan: who benefits?
set *special issue, 1979, item 8; previously published in* ***set*** *76, no.2, item 15; see entry 111.*
A summary of four studies in Britain and the United States.

203a Croft, C.
Assessing the worth of instructional materials.
set *special issue, 1979, item 9; previously published in* ***set*** *78, no.1, item 10; see entry 151.*

204a Pickens, K. and Routledge, M.
Perspective.
set *special issue, 1979, item 10; previously published in* ***set*** *78, no.2, item 3 (Deciding about drugs); see entry 160.*
Brief summary of the state of the art in school drug education.

205a Dorn, N.
The DEDE Project: an experimental project in situational education for decision-making skills.
set *special issue, 1979, item 11; previously published in* ***set*** *78, no.2, item 3 (Deciding about drugs); see entry 161.*

206a Wragg, E.C.
A suitable case for imitation.
set *special issue, 1979, item 12; previously published in* ***set*** *no.1, 1979, item 9; see entry 184.*
A teacher who uses informal methods obtains surprisingly high learning gains for her children.

207a
Children: violent families: emotional development.
***set** special issue, 1979, item 13; previously published in **set** 78, no.2, item 4; see entry 162.*
The effects of emotional deprivation, from the National Children's Bureau Information Service Highlight.

208a Renwick, M.
Going to school: a guide for parents.
***set** special issue, 1979, bonus item; previously published in **set** 78, no.2 (bonus item); see entry 176.*

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NEW ZEALAND EDITION

209 Munro, R.
The Penrose Whanau unit: a case study.
***set** no.1, 1980, item 2.*
Expectations and results of the Whanau house design at Penrose High School.

210 St. George, A.
Teacher expectations and classroom behaviour.
***set** no.1, 1980, item 3.*

211 Easton, B.
The economics of children in a welfare state.
***set** no.1, 1980, item 4.*
Discusses the costs and rewards to society of investment in children.

212 McGill, I., Ramsay, P.D.K. and O'Neil, C.J.
Projecting educational expenditure.
***set** no.1, 1980, item 5.*
The cost of education, present and anticipated.

AUSTRALIAN EDITION

209a Power, C. and Cotterel, J.
The problems of transition from primary to secondary school.
***set** no.1, 1980, item 2.*
Queensland survey of 1662 pupils.

210a Sturman, A.
From school to work: learning to cope.
***set** no.1, 1980, item 3.*

211a Nicholson T.
Putting the answer before the question: a new way of understanding reading comprehension.
***set** no.1, 1980, item 4; also published in New Zealand **set** no.2, 1979; see entry 196.*

212a Johnson, B.
Assessing attitudes to reading: what can teachers do?
***set** no.1, 1980, item 5; also published in New Zealand **set** no.2, 1979; see entry 198.*

BOTH EDITIONS

213 Werry, B. and Utting, P.
Chips with everything.
***set** no.1, 1980, item 6 (Chips with everything).*
How computers can be used in schools.

214 Duncan, K.W.
Batch processing simulations in large classes.
***set** no.1, 1980, item 6 (Chips with everything).*
Describes the successful use of computers in the batch processing of simulations of ecological changes.

215 Rueve, M.H.
How I went from novice to computer expert.
***set** no.1, 1980, item 6 (Chips with everything).*
Humorous account of the experiences of a computerised instructional management system in Cincinnati.

216 Smith, P.K.
How many people can a young child feel secure with.
***set** no.1, 1980, item 7.*
A review of studies of the emotional effects on children of early close relationships with people other than the mother.

217 Campbell, J.
Small is beautiful: some effects of school size on the behaviour of pupils.
***set** no.1, 1980, item 8.*

218 The class size issue rides again.
**set** no.1, 1980, item 9.

219 Power, P.
Student team learning.
**set** no.1, 1980, item 10 (Catering for individual differences).

220 Longbottom, J.
Letting students work on their own: an experiment in 4th form science.
**set** no.1, 1980, item 10 (Catering for individual differences).
Describes the results of self-paced instruction.

221 Lamont, A. and McBride, B.
Assessing internal assessment.
**set** no.1, 1980, item 11.

222 Wagner, G.
Whatever happened to programmed learning?
**set** no.1, 1980, item 12.

223 Elley, W.B.
Assessing what they've learned.
**set** no.1, 1980, item 13.
A guide to classroom testing.

224 Taylor, C.V.
Educational English as she is written.
**set** no.1, 1980, item 14.
Describes a research project on the English of school textbooks, especially for non-native readers.

225 A guide to class nomenclature: ages, stages, classes, years, grades, and systems compared.
**set** no.1, 1980, item 15.
A chart which compares the terms used in the education systems of Australia, New Zealand, the United States, Canada and the United Kingdom.

226 Karmel, P.
Youth, education and employment.
**set** no.1, 1980, bonus item.

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NEW ZEALAND EDITION

227 Freyberg, P.
Who gets to teach?
**set** no.2, 1980, item 2.
Some factors in the selection and training of primary teachers.

228 Pickens, K.
Onside with online.
**set** no.2, 1980, item 3.
Discusses the introduction into New Zealand of computer searching of information databases.

229 Williams, J.
Teachers' centres: premise or premises?
**set** no.2, 1980, item 4.

230 Moynihan, I.
The same mistakes: but more often: second generation Samoan children speaking English.
**set** no.2, 1980, item 5.

231 The promotion of women in the teaching service.
**set** no.2, 1980, item 6.

AUSTRALIAN EDITION

227a Atkinson, E.P. and Atkinson, J.M.
What secondary school for my child?
**set** no.2, 1980, item 2.

228a Sharman, K.
TV and school achievement?: a real poser.
**set** no.2, 1980, item 3.

229a Baldauf, R.B.
Testing the reading comprehension of second language beginners: an integrative approach.
**set** no.2, 1980, item 4; later published in New Zealand **set** no.1, 1981 in slightly revised form; see entry 244.

230a Robinson, V., Glynn, T., McNaughton, S. and Quinn, M.
Parents as remedial reading tutors: a report of the Mangere Home and School Project.
**set** no.2, 1980, item 4; also published in New Zealand **set** no.2, 1979; see entry 195.

231a Reid N.
'Go look it up yourself': developing study skills in primary and secondary schools.
**set** no.2, 1980, item 6; also published

in ***set*** *no.2, 1979; see entry 202.*

BOTH EDITIONS

232 Maughan, B. and Ouston, J.
Fifteen thousand hours: findings and implications.
set *no.2, 1980, item 7.*
Item by two of the authors of Rutter, M. et al. *Fifteen thousand hours: secondary schools and their effects on children.*

233 Croft, C.
The foundations of school testing.
set *no.2, 1980, item 8.*

234 Test evaluation sheet.
set *no.2, 1980, item 9.*
A checklist for evaluating the validity, reliability and usability of a test; designed for use with item 8.

235 Ward, G.
Learning time and teaching for mastery.
set *no.2, 1980, item 10.*

236 Battersby, D.
Beginning teachers: modern day Robinson Crusoes.
set *no.2, 1980, item 11.*

237 Ryba, K. and Christiansen, B.
The microcomputer in school: 1, A research project in special education; 2, Back-up services for computer-assisted instruction; 3, The microcomputer, what is she?
set *no.2, 1980, item 12.*

238 Reid, N.
Wanted: gifted teachers for gifted kids.
set *no.2, 1980, item 13.*

239 Livingstone, I.
Twenty years on: students of 1955 in mid-career.
set *no.2, 1980, bonus item.*
Report on a longitudinal project studying the careers of university students first enrolling at university in New Zealand in 1955.

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set number, 1981

NEW ZEALAND EDITION

465

240 Geddes, M.
1981 – International Year of Disabled Persons.
set *no.1, 1981, item 2 (1981: International Year of Disabled Persons).*

241 Wilton, K.
Research on 'mainstreaming': a New Zealand example.
set *no.1, 1981, item 2 (1981: International Year of Disabled Persons).*

242 Wilton, K.
Research on New Zealand special education, 1970-1980: bibliography.
set *no.1, 1981, item 2 (1981: International Year of Disabled Persons).*

243 Zepke, N.
Educational directions for the year 2000.
set *no.1, 1981, item 3.*

244 Baldauf, R.B.
Testing the reading comprehension of second language beginners: an integrative approach.
set *no.1, 1981, item 4; first published in Australian* ***set*** *no.2, 1980, see entry 229a. Slightly revised in this edition.*

245 Levine, S.V.
The psychological and social effects of youth unemployment.
set *no.1, 1981, item 5.*

AUSTRALIAN EDITION

240a Jackson, P., Reid, N., Croft, A.C. and Cowie, C.
FOSSIC: a study skills rating schedule.
set *no.2, 1980, item 14; also published in New Zealand* ***set*** *no.1, 1979 in an earlier format; see entry 178.*

241a Glynn, T., McNaughton, S., Robinson, V. and Quinn, M.
Remedial reading at home: helping you to help your child.
set *no.2, 1980, bonus item; also published in* ***set*** *no.2, 1970; see entry 208.*
A booklet for parents and teachers from research in 230a.

242a Mannison, M., Bycroft, P. and Sinnamon, J.
Being there.
set *no.1, 1981, item 2.*
How the physical environment of the classroom can play an important role in the educational process.

243a Bourke, S.
Community expectations of numeracy in schools.
set *no.1, 1981, item 3.*
A survey of which skills in mathematics are regarded as most important by the public.

244a De Lemos, M.
Continuous enrolment at age five.
set *no.1, 1981, item 4.*
A look at the system practised in New Zealand.

245a Anderson, J.
Reading: to test or not to test?
set *no.1, 1981, item 5.*
How to use reading tests most effectively.

BOTH EDITIONS

246 Galloway, D.
Disruptive pupils.
set *no.1, 1981, item 6.*

247 Smith, P.K. and Connolly, K.J.
Playgroup ecology.
set *no.1, 1981, item 7.*
The effects of the physical and social environment on preschool children's behaviour.

248 Wilkins, R.A.
A developmental approach to moral education.
set *no.1, 1981, item 8.*

249 McGee, C.
Classroom discussion and questioning: some patterns and in-service effects.
set *no.1, 1981, item 9.*

250 Jenkinson, J.
Does intelligence equal learning ability?
set *no.1, 1981, item 10.*

251 Fordham, A.
Teaching practices.
set *no.1, 1981, item 11.*

252 Turnbull, W.
Achievement test scores in perspective.
set *no.1, 1981, item 12.*
Discusses what the standardized achievement test can and cannot do.

253 Wagner, G.
Using readability formulas in the classroom.
set *no.1, 1981, item 13.*

254 Rithakananone, P., Siemon, D. and Nixon, M.
Young children's ordering behaviour.
set *no.1, 1981, item 14.*

255 Anderson, D.
Transition from school: a review of research and its relation to policy.
set *no.1, 1981, item 15.*
A review of current research and its relation to policy decisions which governments must take in this time of high youth unemployment.

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set number 2, 1981

NEW ZEALAND EDITION

256 Meade, A.
Don't take that dress off James!: have we got anywhere in trying to remove sex-role stereotyping in preschools and junior school classes?
set *no.2, 1981, item 2.*

257 Fargher, R. and Ziersch, R.
School, Hermannsburg, 1974.
set *no.2, 1981, item 3 (What happened at Hermannsburg?).*
The school-community relationship in an Australian town, and the problems caused by cultural differences in an Aboriginal school.

258 Harker, R.
Community control vs social mobility: some cross-cultural considerations.
set *no.2, 1981, item 3 (What happened at Hermannsburg?).*
The place of culture in education and

the community, in New Zealand and Australia.

259 Shuker, R.
Changing the curriculum : can we do better?
set *no.2, 1981, item 4.*
A case study of an instance of curriculum development in New Zealand secondary schools.

AUSTRALIAN EDITION

256a Stevenson, B. and Ralston, F.
Reading together: parents helping at school.
set *no.1, 1981, item 16.*

257a Craig, R.A. and Cawthron, E.R.
Rural education and its aftermath.
set *no.2, 1981, item 2.*
Study of whether rural children are disadvantaged at school and after they leave.

258a Fyfield, J.A. and Tisher, R.P.
New teachers in Australian schools: expectations, satisfactions, concerns and provisions.
set *no.2, 1981, item 3.*

259a Vincent, D.
Reading ages and reading tests.
set *no.2, 1981, item 4.*

BOTH EDITIONS

260 Coulter, F.
Homework in secondary schools.
set *no.2, 1981, item 5.*

261 Freyberg, P. and Osborne, R.
Who structures the curriculum: teacher or learner?
set *no.2, 1981, item 6.*
The results of research into concepts and cognitive structures of children and how the curriculum affects these.

262 Giacobbe, M.E.
Kids can write the first week of school.
set *no.2, 1981, item 7.*

263 Gilmore, A.
Combining scores.
set *no.2, 1981, item 8.*
Information for teachers on how to combine students' marks from different tests, exercises, or subjects.

264 Thompson, B.
Reading words with context and without.
set *no.2, 1981, item 9.*

265 Mitchell, D.
Parents: the untapped resource in special education.
set *no.2, 1981, item 10.*
Results of the University of Waikato's Project PATH (Parents as Teachers of the Handicapped).

266 Smith, G. and Bowes, J.
The hearing impaired child in a 'normal' secondary school.
set *no.2, 1981, item 11.*

267 Jackson, S. and Jackson, B.
Childminder.
set *no.2, 1981, item 12.*
Excerpts from the book, *Childminder* on day care in Great Britain.

268 Jones, J.
Study skills: panacea, placebo or promise?
set *no.2, 1981, item 13.*
How students study, and whether study skills can be taught.

269 Rickards, J.P.
Learning from print: notetaking, underlining, inserted questions, and organizers.
set *no.2, 1981, item 14.*

270 St. George, R.
Troubled times for educational testing.
set *no.2, 1981, item 15.*
Describes the current public concern over educational testing, especially in the United States.

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set number 1, 1982

NEW ZEALAND EDITION

271 Meade, A.
Who talks to William?: and Karla, and Susan, and Michael, and ...?: adult-child interaction, particularly conversation, in early childhood centres.
set *no.1, 1982, item 2.*

272 Kuiper, K.
Going to university.
set *no.1, 1982, item 3.*
Who gets to university and what subjects they choose.

273 Jamieson, P.
Silencing minorities.
set *no.1, 1982, item 4.*
The role of minority languages in New Zealand.

274 Thompson, B.
Initial vocabularies for reading.
set *no.1, 1982, item 5.*
Lists of words which appear frequently in sets of books used for the initial teaching of reading; expanded from the *New Zealand Basic Word List.*

AUSTRALIAN EDITION

270a Foster, L., Rado, M. and Rowley, G.
Success in a bilingual programme.
set *no.1, 1982, item 2.*
Research in Melbourne.

271a Fargher, R. and Ziersch, R.
School, Hermannsburg, 1974.
set *no.1, 1982, item 3. (What happened at Hermannsburg?); also published in New Zealand* ***set*** *no.2, 1981; see entry 257.*
Cultural differences caused major disruptions to school and community.

272a Harker, R.
Community control vs social mobility: some cross-cultural considerations.
set *no.1, 1982, item 3. (What happened at Hermannsburg?); also published in New Zealand* ***set*** *no.2, 1981; see entry 258.*
The place of culture in education and the community.

273a sex index, Australian edition, 1979-1981.
set *no.1, 1982, item 4.*

274a Smyth, J.
Time on-task: is it enough?
set *no.1, 1982, item 5.*
Positive relation between time-on-task, or pupil-engaged-learning-time and success in school subjects.

BOTH EDITIONS

275 Cullen, J.
Learning to cope with failure in the early school years.
set *no.1, 1982, item 6.*

276 White, R.
Probing techniques.
set *no.1, 1982, item 7 (Two lessons in one: what you taught and what they learned in science).*
Gives techniques for discovering if pupils understand science concepts and principles.

277 Tasker, R.
From a researcher's notebook.
set *no.1, 1982, item 8 (Two lessons in one: what you taught and what they learned in science).*
Describes the basic misunderstanding between the teacher and pupils in a science class of form 1 (11-year-old) pupils.

278 Dwyer, U.
Jennifer.
set *no.1, 1982, item 9.*
Classroom observation of the interaction between teacher and pupils, one pupil in particular.

279 Pocket calculators.
set *no.1, 1982, item 10.*
Adapted version of *Electronic calculators and arithmetic: an experiment in Danish schools* by J. Ethelberg-Laursen.

280 Choosing a calculator.
set *no.1, 1982, item 11.*

281 Ritchie, J.
Corporal punishment.
set *no.1, 1982, item 12.*
Information from two recent surveys on corporal punishment in New Zealand schools.

282 Philips, D.
Evaluating writing.
set *no.1, 1982, item 13.*

283 Mabbett, B.
How to use *set*.
set *no.1, 1982, item 14 (Mainly for principals).*
Suggestions for the effective use of ***set***.

468

284 Julian, R.
Brought to mind: the full report of 1977 condensed and brought up-to-date for 1981.
set *no.1, 1982, bonus item, New Zealand only.*
A study of informal family day care in four geographical areas in New Zealand.

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set number 2, 1982

NEW ZEALAND EDITION

285 Fortune, I.
Books: research into the reading, buying, and borrowing of books in New Zealand.
set *no.2, 1982, item 2.*

286 Benton, R.
The anatomy of a word list.
set *no.2, 1982, item 3.*
The principles and practices of a basic word list explained with references to *The First Basic Maori Word List.*

AUSTRALIAN EDITION

285a Zahnleiter, J.
The professional and children's literature.
set *no.2, 1982, item 2.*
How to encourage a love of reading.

286a Thompson, B.
Initial vocabularies for reading.
set *no.2, 1982, item 3; also published in New Zealand* ***set*** *no.2, 1982; see entry 274.*
Lists of words appearing in books used for early reading.

BOTH EDITIONS

287 Pickens, K.
Coping with volatile situations: a guide for teachers.
set *no.2, 1982, item 4.*
A review of research on sniffing (inhalant or solvent abuse).

288 Rosemergy, M.
The importance of being father.
set *no.2, 1982, item 5.*
Review of research on the role of the father.

289 Smith, P.K.
How important is fantasy play?
set *no.2, 1982, item 6.*
The role of fantasy play in child development.

290 Croft, C.
Non-verbal tests in schools.
set *no.2, 1982, item 7.*

291 Leapman, M.
Dr Fox.
set *no.2, 1982, item 8.*
A humorous description of how unintelligible prose earns greater respect than easy-to-read prose.

292 Rendell, P. and Nixon, M.
Children's knowledge of time.
set *no.2, 1982, item 9.*

293 Frampton, O.
Slow learners, segregated and integrated.
set *no.2, 1982, item 10.*
An experiment in which groups of slow-learners were either segregated or integrated with other children.

294 Renzulli, J.S. and Hartman, R.K.
Scale for rating behavioural characteristics of superior students.
set *no.2, 1982, item 11.*

295 Reid, N.
Improving the format of classroom tests.
set *no.2, 1982, item 12.*

296 Cummins, J.
A test is a test are tests: psychological tests and students for whom English is a second language.
set *no.2, 1982, item 13.*

297 Raskin, J.
Glossary: Jef Raskin's brief dictionary of computerese.
set *no.2, 1982, item 14.*
A short list of terms used about computers in education, and a humorous 'computerese glossary'; reprinted from *Apple*, Vol.1, no.1.

298 Monash Television and Children Project.
TV is funny, boring, exciting... 'but I love it!' Two studies of children's

television by the Faculty of Education, Monash University, and Herald-Sun Television, Channel 7.
set *no.2, 1982, bonus item.*

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set number 1, 1983

NEW ZEALAND EDITION

299 Ryan, C.
Falling rolls: the experience of two Christchurch secondary schools.
set *no.1, 1983, item 2.*

300 Thompson, B.
More time at school?: New Zealand trends in school participation.
set *no.1, 1983, item 3.*
Changes in time spent at school for males and females; effects of unemployment, further education, and School Certificate.

301 Dakin, J.C.
Retrenchment and restraint in educational expenditure, 1880-1980.
set *no.1, 1983, item 4.*

AUSTRALIAN EDITION

299a Williams, T.
Youth in transition.
set *no.1, 1983, item 2.*
ACER research on school to work or further education or unemployment.

300a Youth in transition: media reaction to 'School, work and career.'
set *no.1, 1983, item 3.*
Newspaper articles.

301a Letters from youth in transition.
set *no.1, 1983, item 4.*
Letters to the researchers from the participants in the 'Youth in Transition' project.

BOTH EDITIONS

302 Croft, C.
Words that count: findings from a national survey of primary children's writing.
set *no.1, 1983, item 5.*

303 Thomas, V.
Learning to spell: making use of morphemic information.
set *no.1, 1983, item 5.*

304 Gough, J.
Mathematics learning: what error analysis can tell us.
set *no.1, 1983, item 6.*

305 Lawrence, P.
Jean Piaget in retrospect.
set *no.1, 1983, item 7.*

306 Brown, S. and Fitzpatrick, J.
Breaking the sex-stereotyping circle.
set *no.1, 1983, item 8.*
Examination of sex-stereotyping of school subjects.

307 McDaniel, T.
'Well begun is half-done': a school wide project for better discipline.
set *no.1, 1983, item 9.*

308 Lewis, R. and Lovegrove, M.
Pupils on punishment.
set *no.1, 1983, item 10.*
Secondary school students' views of classroom control techniques.

309 Rowley, G. and Macpherson, C.
Criterion-referenced measurement.
set *no.1, 1983, item 11.*
Explanation of criterion-referenced tests and their uses.

310 Campbell, J. and Robinson, M.
Three dozen's a crowd.
set *no.1, 1983, item 12.*
Results of a study of effects on children of increased and reduced class size.

311 Kroger, J.
I knew who I was when I got up this morning: the transitions of adolescence.
set *no.1, 1983, item 13.*
Changing attitudes of young people during late primary and secondary school years.

312 Taylor, J.
What makes good software?
set *no.1, 1983, item 14.*
Guide for teachers on evaluating computer software.

313 Finger, J.
Teachers should read?: the periodical literature of the teaching profession: concerns and cures.
set *no.1, 1983, item 15.*

313a How to get the most out of your textbooks: a student service.
set no.1, 1983, bonus item, Australian edition only.
Published in Australia by the United States Book Association, distributed by Campus Booksellers Group.

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set number 2, 1983

NEW ZEALAND EDITION

314 Bunce, J.
The ideal family: a study of the views of young adults.
***set** no.2, 1983, item 2.*

315 Committee on Basic Skills Education
Computer overkill.
***set** no.2, 1983, item 3.*
A critical look at the value of the micro-computer to education.

316 Morris, B.
It was good fun getting here, but what do I do now? : a survey of those who hold the New Zealand Playcentre National Supervisors Certificate.
***set** no.2, 1983, item 4.*

AUSTRALIAN EDITION

314a Gare, R.
Seeing is believing: a guide to the evaluation of educational computer programs.
***set** no.2, 1983, item 2.*

315a Computer program check list
***set** no.2, 1983, item 3.*
For evaluating computer programs; goes with item 314a.

316a Ainley, J. and McKenzie, P.
Principally for principals: resource allocation and government schools in Australia and New Zealand.
***set** no.2, 1983, item 4.*
Summary of 3 volume ACER *Study of Staffing and Resources.*

BOTH EDITIONS

317 Alton-Lee, A.
Organizing for learning: the results of an ecological study.
***set** no.2, 1983, item 5.*
Describes successful new teaching techniques with 8- and 9-year-olds.

318 Rows versus tables: a summary of work by K. Wheldall, M. Morris, P. Vaughan and Y.Y. Ng.
***set** no.2, 1983, item 6.*
Summary of research on classroom seating patterns.

319 Weeks, A.
Stand by your desks: obsolete desk formations can lose the battle for order and defeat attempts to parlez.
***set** no.2, 1983, item 7 (Stand by your desks!: two articles on classroom arrangement).*

320 Dickinson, C.
Gone to the wall.
***set** no.2, 1983, item 7 (Stand by your desks!: two articles on classroom arrangement).*

321 Pizzo, J.
Breaking the sound barrier: classroom noise and learning style.
***set** no.2, 1983, item 8.*

322 Rossiter, A.
Difficult-to-teach junior school children.
***set** no.2, 1983, item 9.*

323 Gentry, R.
Spelling genius at work: an analysis of developmental spelling in *GNYS AT WRK.*
***set** no.2, 1983, item 10.*
Studies the developmental stages in learning to spell.

324 Philips, D.
Encouraging writing: helping pupils to enjoy the writing process.
***set** no.2, 1983, item 11.*

325 Wilkins, R.
Classroom management.
***set** no.2, 1983, item 12.*

326 Scully, M.
Learning to read naturally.
***set** no.2, 1983, item 13.*
A practising remedial reading teacher explains the techniques she uses.

327 Pohl, H.
What do we know about adolescent

reading?
set *no.2, 1983, item 14.*
Explains different theories of reading.

328 Hobbs, T.
Selecting appropriate work experience.
set *no.2, 1983, item 15.*
The aims and practices of work experience.

329 Reid, N. and Gilmore, A.
Test bias!: test bias?
set *no.2, 1983, item 16.*
Examines types of test bias, and ways of dealing with them.

329a Board of Teacher Education (Queensland).
Secondary schooling and the world of work.
set *no.2, 1983, bonus item, Australian edition only.*
Summary of a conference on the results of a survey of teachers.

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set number 1, 1984

NEW ZEALAND EDITION

330 Meade, A.
After school, and in the holidays.
set *no.1, 1984, item 2.*
Results and suggestions from a Wellington survey of after-school and holiday care for the children of working parents.

331 O'Neill, J.
Counting chickens: a commentary on primary, secondary and tertiary roll projections.
set *no.1, 1984, item 3.*

332 Cubey, P.
What happens when a child starts school?: three books and three projects reviewed.
set *no.1, 1984, item 4.*

333 Maconie, J.
A survey of Form 6 girls' reading in a multicultural school.
set *no.1, 1984, item 5.*

AUSTRALIAN EDITION

330a Davies, J.
Teaching television commericals.
set *no.1, 1984, item 2.*
Using the analysis of commercials in the classroom.

331a Kafer, N.
The skills of friendship.
set *no.1, 1984, item 3.*
Children's development of social techniques.

332a Jackson, M.
When a child steals: how to prevent it and what to do about it.
set *no.1, 1984, item 4.*
Booklet designed for parents, teachers, and the police.

333a Fogelman, K.
Growing up in Great Britain: a review of the National Child Development Study.
set *no.1, 1984, item 5; later published in New Zealand* ***set*** *no.1, 1986; see entry 386.*

BOTH EDITIONS

334 Hay, J.
Stories to read in class.
set *no.1, 1984, item 6.*
A selection of titles, for 5 different levels in primary schools, of favourite books as selected by the author, the critics, the teachers, and finally, the children.

335 Holbrook, A.
Give them a good hand.
set *no.1, 1984, item 7.*
Review of research into the effects of good handwriting on essay marks.

336 Lally, M.
Writing to an Apple: computer-based handwriting development.
set *no.1, 1984, item 8.*

337 Gough, J.
Copy this: considering the process of handwriting in a copying task.
set *no.1, 1984, item 9.*

338 Mander, R.
Teaching left-handers to write.
set *no.1, 1984, item 10.*

339 Baddeley, A.
Reading and working memory.
set *no.1, 1984, item 11.*

Research into the use of short-term memory, and its effect on learning to read.

340 Hunting, R.
'What comes after one?': very junior maths.
set *no.1, 1984, item 12.*
How children use counting and construct their mathematical knowledge.

341 Wilkins, R.
Classroom discipline.
set *no.1, 1984, item 13.*

NEW ZEALAND EDITION

342 Nicholson, T.
The confusing world of high school reading: what the teacher doesn't see.
set *no.1, 1984, item 14.*
The problems of lack of comprehension in reading, and its effects across the curriculum.

343 White, R.
The end of schools as we know them: the implications of recent educational research for learning, teaching, and school organisation.
set *no.1, 1984, item 15.*
Research into effective learning styles, and what this means for school organisation.

AUSTRALIAN EDITION

342a Henshaw, A.
The fullstop.
set *no.1, 1984, item 14.*
What a group of beginning readers thought about the fullstop.

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set number 2, 1984

NEW ZEALAND EDITION

344 Clift, J., Turner, I. and Willis, D.
Students at Victoria University: performance and school-leaving qualification compared.
set *no.2, 1984, item 2.*

345 Renwick, M.
Teachers College students who are also parents.
set *no.2, 1984, item 3.*
The comments of student-parents on their teachers college training, from their viewpoint as parents.

346 Croft, C.
PAT: Study Skills – after the tests, what next?
set *no.2, 1984, item 4.*
Explains how results from the PAT: Study Skills test can be used in schools.

347 Nicholson, T.
The confusing world of high school reading, part 2: how the teacher can see.
set *no.2, 1984, item 5.*
Techniques teachers can use to discover the extent of lack of comprehension in reading.

AUSTRALIAN EDITION

344a Jenkinson, J.
The integration issue.
set *no.2, 1984, item 2.*
The integration (mainstreaming) of disabled children into the regular school system.

345a Richards, L.
Teaching peace.
set *no.2, 1984, item 3.*
Issues raised by education for peace, or peace studies.

346a Nicholson, T.
The confusing world of high school reading, part 1: what the teacher doesn't see.
set *no.2, 1984, item 4; also published in New Zealand* ***set*** *no.1, 1984; see entry 342.*
Lack of comprehension and its effects across the curriculum.

347a Nicholson, T.
The confusing world of high school reading, part 2: how the teacher can see.
set *no.2, 1984, item 5; also published in New Zealand* ***set*** *no.2, 1984; see entry 347.*
Techniques for teachers to discover the extent of problems.

BOTH EDITIONS

348 Pickens, K.
Drugs demystified training pack: what it is and where to get one.
***set** no.2, 1984, item 6.*
Describes an in-service training pack from the London-based Institute for The Study of Drug Dependence (ISDD), on the nature and aspects of both legal and illegal drugs, and the ways of coping with the problems associated with their misuse.

349 Briggs, F.
Streaming rediscovered.
***set** no.2, 1984, item 7.*
Research on and experience of ability grouping.

350 Elley, W.
To stream or not to stream?: a review of research on streaming.
***set** no.2, 1984, item 8.*

351 Reid, N.
Streaming vs non-streaming: what research doesn't tell us.
***set** no.2, 1984, item 9.*

352 Kealey, M.J.
Meats and veges: an ethnographic study of two grammar school classes.
***set** no.2, 1984, item 10.*
An account of ability grouping in an Auckland boys' secondary school.

353 Trethowan, D.
Managing to learn: the relevance of management training for head teachers.
***set** no.2, 1984, item 11.*

354 Richards, L.
What does the crocodile have for dinner? : a look at how children may use the worldwide data bases via the school computer.
***set** no.2, 1984, item 12.*

355 Rowe, H.
Problem solving strategies.
***set** no.2, 1984, item 13.*
Results of research into how individuals utilise their time on-task.

356 Stoessiger, R.
Education and rural development.
***set** no.2, 1984, item 14.*
Summary of five studies on how development in Australian and NZ rural areas was assisted by education.

357 Reid, N.
They must know their alphabet: a study of school skills and work skills to help transition.
***set** no.2, 1984,item 15.*

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set number 1, 1985

NEW ZEALAND EDITION

358 Powell, J.
A whanau in action: an evaluation of the Wellington High School whanau.
***set** no.1, 1985, item 2.*
A 'family' structure evaluated after one year, and after four years.

359 Ramsay, P.D.K.
The impact of technology on our multi-cultural community.
***set** no.1, 1985, item 3.*
As jobs get more technical and scarcer can schools adapt?

360 Marland, E.
***set* index, 1974-1984.**
***set** no.1, 1985, item 4.*

AUSTRALIAN EDITION

358a St. George, A.
Teacher expectations and classroom behaviour.
***set** no.1, 1985, item 2; earlier version published in New Zealand **set** no.1, 1980; see entry 210.*
Observation research on self-fulfilling prophesies.

359a Ross, K.
The measurement of disadvantage.
***set** no.1, 1985, item 3.*
Concept and operation of Australian Disadvantaged Schools Programme.

360a Murphy, G.
Predicting work experience.
***set** no.1, 1985, item 4.*
Teachers were not good at predicting the success of their pupils during work experience.

BOTH EDITIONS

361 Dobson, J. and Gale, R.
Corporal punishment: help for teachers.
***set** no.1, 1985, item 5.*
Includes 22 alternatives, from the British Psychological Society.

362 Smith, J., McDougall, L., Springthorpe, J. and Clouston, J.M.
Classroom research by new teachers.
***set** no.1, 1985, item 6.*
Smith introduces work on writing, comprehension and attitudes to handicaps.

363 McMillan, B., and Meade, A.
Observation: the basic techniques.
***set** no.1, 1985, item 7.* -
Handbook for classroom and pre-school researchers.

364 Corballis, M.
The neuropsychology of reading.
***set** no.1, 1985, item 8.*
Brain injury research has led on to new insights.

365 Tizard, B.
Problematic aspects of nuclear education.
***set** no.1, 1985, item 9.*
Children are afraid of nuclear war, but also of failing exams and other crises. A review of research.

366 Mintzberg, H.
The manager's job: folklore and fact.
***set** no.1, 1985, item 10.*
Reprint of a famous *Harvard Business Review* article.

367 Elley, W.
What do children learn from being read to?
***set** no.1, 1985, item 11.*
Research for the Canterbury Branch of the International Reading Association.

368 Shepheard, M.
Investigating race relations in class.
***set** no.1, 1985, item 12.*
A teacher writes of his experiences, with hints.

369 Morris, J. and Bluff School Staff.
Home visiting: a way to improve relationships and enhance learning.
***set** no.1, 1985, item 13.*
The successful results of parent interviews in the home.

370 Goldman, R. and Goldman, J.
A baseline for sex education.
***set** no.1, 1985, item 14.*
Comparative study, Australia, UK, USA, Sweden.

370a Australian Department of Education
Patterns of retention in Australian government schools: a summary report.
***set** no.1, 1985, bonus item, Australian edition only.*
Summary of report on post-compulsory schooling by J. Ainley, M. Batten and H. Miller.

---

set number 2, 1985

NEW ZEALAND EDITION

371 St. George, R. and McAlpine, D.
Infernal internal assessment, again!
***set** no.2, 1985, item 2.*
Issues, advantages, techniques.

372 Hunkin, D.
Management strategies for the multicultural classroom.
***set** no.2, 1985, item 3.*
Discusses Polynesian learning style and what successful teachers do.

373 McGee, C.
Additional qualifications: what teachers prefer.
***set** no.2, 1985, item 4.*

AUSTRALIAN EDITION

371a Balson, M.
Discipline: an old problem in a new world.
***set** no.2, 1985, item 2.*
How teachers can apply individual psychology in the classroom.

372a Bourke, S.
Teaching primary mathematics.
***set** no.2, 1985, item 3.*
Which techniques are efficient, which liked by the pupils.

373a Ellerton, N.
A child's perspective of algebra.
set *no.2, 1985, item 4.*
Interviews with 11- and 13-year-olds.

BOTH EDITIONS

374 Meade, A. and Staden, F.
Once upon a time, amongst blocks and car cases... action research to enable girls' mathematics learning.
set *no.2, 1985, item 5.*
Action research on pre-school mathematical experiences for girls.

375 Church, J.
Family violence: its effects on children.
set *no.2, 1985, item 6.*
Lessons for schools from a study of abused wives.

376 Toppins, A.D.
One-pulse words: short, sweet and to the point.
set *no.2, 1985, item 7.*
A mind clearing exercise – using one-syllable words once a day.

377 Tizard, Barbara
What Joyce learnt from her mother.
set *no.2, 1985, item 8.*
Talk at home may be very different from that at school, and better teaching. Assumptions about potential from school behaviour can be quite wrong.

378 Marriott, R. and Elley, W.
Teaching from a learning point of view.
set *no.2, 1985, item 9.*
Barriers to learning from technical institute courses, and remedies.

379 Lamb, H.
IEA written composition study: early findings.
set *no.2, 1985, item 10.*
Comparative study of 18,000 essays from 15 countries.

380 Smith, A.
Looking up: children's ideas about teachers and principals.
set *no.2, 1985, item 11.*
Results of interviews with 208 six-year-olds.

381 Limbrick, L., McNaughton, S. and Cameron, M.
Peer tutoring.
set *no.2, 1985, item 12.*
Theory and account of successful tutoring in reading.

382 Limbrick, L., McNaughton, S. and Cameron, M.
Peer power: using peer-tutoring to help low-progress readers in primary and secondary schools.
set *no.2, 1985, item 13.*
This booklet has all you need to get a peer-tutoring programme for slow readers up and running.

383 McSweeney, K.
Children's views on nuclear issues.
set *no.2, 1985, item 14.*
Survey at Lincoln High School.

384 Somogyvary, R.
Now for something completely different: teaching a dyslexic child to read by braille – an experiment.
set *no.2, 1985, item 15.*
A disturbed dyslexic girl, though sighted, learnt braille and was unexpectedly helped.

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set number 1, 1986

NEW ZEALAND EDITION

385 Cameron, P. and Robinson, G.
Ten years of open plan.
set *no.1, 1986, item 2.*
Probe of how attitudes and practices have changed.

386 Fogelman, I.
Growing up in Great Britain: a review of the National Child Development Study.
set *no.1, 1986, item 3.*
Report on longitudinal study of all UK citizens born 3-9 March 1958.

387 Ahlgren, M.
New Zealand sign language and the aim of Total Communication for the deaf.
set *no.1, 1986, item 4.*
Once forbidden in schools, sign

language is very important to the deaf.

AUSTRALIAN EDITION

385a Bourke, S.
Classes of questions: questions of classes.
set *no.1, 1986, item 2.*
A study of questions asked in 75 Melbourne classrooms, during Year 5 mathematics lessons.

386a Collis, K. and Biggs, J.
Using the SOLO taxonomy.
set *no.1, 1986, item 3; later published in New Zealand* ***set*** *no.2, 1986; see entry 400.*
How to systematically assess quality in learning.

387a Mercer, K.
Are you a possessive teacher?
set *no.1, 1986, item 4.*
Student teachers doing professional practice often find the supervising teacher directing the teaching.

BOTH EDITIONS

388 Twiss, D.
Signing: learning a language through a sign system.
set *no.1, 1986, item 5.*
Sign language acquisition is as fast as for spoken words. Help for parents and teachers of the deaf.

389 Stephens, G. and Stephens, R.
Integration at the chalk face.
set *no.1, 1986, item 6.*
Two classes, one hearing, the other deaf, mix regularly.

390 Ainley, M.
Tactual graphics for the visually impaired.
set *no.1, 1986, item 7. (What is it like if it's too big to grasp?).*
Describes raised-surface graphics for the blind. An example from a 'picture book' was included with this item.

391 Douglas, J.
Learning to read landform from a tactile contour map.
set *no.1, 1986, item 7. (What is it like if it's too big to grasp?).*
The use of actual features and models to teach the concept of contours, then tactile graphics, to the blind.

392 Offenberger, D.
Mainstreaming and the science teacher.
set *no.1, 1986, item 8.*
Particular reference to teaching the visually impaired.

393 Hegarty-Hazel, E.
Lab work.
set *no.1, 1986, item 9.*
Making lab work in science teaching more efficient.

394 Sutton-Smith, B.
The child at play.
set *no.1, 1986, item 10.*
Play is becoming less physical, more solitary.

395 Liberman, M.
TV talk too terse: the verbal language of television.
set *no.1, 1986, item 11.*
A vocabulary of all words used in seven TV programmes shows that very impoverished language is being used.

396 Philips, D.
Six weeks writing in two secondary school classrooms.
set *no.1, 1986, item 12.*
Every scrap of writing done by two classes in 6 weeks was collected and analysed.

397 Farmer, I. and Dixon, J.
Staging points in personal narrative.
set *no.1, 1986, item 13.*
From teachers' judgements an assessment tool was created.

397a Australian Optometrical Association
A teachers' guide to vision problems in children.
set *no.1, 1986, bonus item. Australia only.*

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set number 2, 1986

NEW ZEALAND EDITION

398 Rosemergy, M. and Meade, A.
Family networks: who cares for the caregiver while the caregiver's caregiving?
set *no.2, 1986, item 2.*

399 Sutton, R.
Does remedial maths help?
***set** no.2, 1986, item 3.*
Examination of Christchurch secondary schools' programmes.

400 Collis, K. and Biggs, J.
Using the SOLO taxonomy.
***set** no.2, 1986, item 4; previously published in Australian **set** no.1, 1986; see entry 386a.*
How to mark for quality as well as quantity.

AUSTRALIAN EDITION

398a Marland, E.
***set* index : Australian edition: from *set* special issue 1979, to *set* no.1, 1986.**
***set** no.2, 1986, item 2.*

399a Cohen, D.
Towards the improvement of secondary schools.
***set** no.2, 1986, item 3.*
Result of the Curriculum Action project.

400a Crocker, W.J.
Improving nonverbal communication.
***set** no.2, 1986, item 4.*

BOTH EDITIONS

401 Reed, K.
Computers – how to get started.
***set** no.2, 1986, item 5.*
Advice after helping 20 schools work out their aims first.

402 Philips, D.
Writing with a word processor.
***set** no.2, 1986, item 6.*
Dramatic improvements in work and attitudes of both pupils and teachers.

403 Carr, K.C.
There are numbers behind the piano: children's construction of meaning in mathematics.
***set** no.2, 1986, item 7.*
Asking bizarre questions uncovers primary school childrens' insights and misconceptions.

404 Dalzell, D.
Interactive teaching: on first using the approach.
***set** no.2, 1986, item 8.*
Basing class work on what children ask. A case study in primary school science.

405 Podmore, V. and Bird, L.
Taking care of themselves: children can do more than we think.
***set** no.2, 1986, item 9.*
At five years old children know a lot about how to keep well.

406 Solman, R.
Teaching sight-words: pictures do not help.
***set** no.2, 1986, item 10.*
Ordinary practices proved counterproductive in this early-reading research.

407 Watkins, D.
Improving tertiary learning: implications from an Australian research programme.
***set** no.2, 1986, item 11.*
Learning mindlessly, by rote, is efficient only in a few limited situations. Effects and solutions.

408 Benton, R.
Now fades the glimmering... research in classrooms in New Zealand.
***set** no.2, 1986, item 12.*
Review of New Zealand classroom research and new insights.

409 Nicholson, T.
Good readers don't guess.
***set** no.2, 1986, item 13.*
The Goodman/Gough debate on beginning readers' techniques. Part 1 of a pair of items – practical advice in the next.

410 Nicholson, T.
Taking the guesswork out of teaching reading: part 2 of 'Good readers don't guess.'
***set** no.2, 1986, item 14.*
Practical advice flowing from the research in the previous item.

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set number 1, 1987

411 Wilson, N.
Madder, badder, sadder: children's

perceptions of the future.
***set** no.1, 1987, item 2.*

412 Hughes, P.
Learning and shaping the future.
***set** no.1, 1987, item 3.*
Few 15-year-olds think they can influence their futures. Giving them the power to do so is outlined.

413 Withers, G.
One extreme to the other: a report on profile reports.
***set** no.1, 1987, item 4.*
Profile reports described and evaluated.

414 McDonald, G.
The use of video recording for the study of young children.
***set** no.1, 1987, item 5.*
A guide to using this new research technique.

415 Newsam, P.
Race and education: more questions than answers.
***set** no.1, 1987, item 6.*
British experience.

416 Johnstone, R.
'They don't eat like us.' : prejudice and a social studies unit.
***set** no.1, 1987, item 7.*
A simple technique to check what effect teaching on cultural differences is having.

417 Alton-Lee, A., Nuthall, G. and Patrick, J.
'Take your brown hand off my book': racism in the classroom.
***set** no. 1, 1987, item 8.*
A spin-off from classroom research – normally hidden race prejudice and its causes.

418 Adler, C.
Writers at risk: including an assessment method for teachers and researchers to identify the strengths and weaknesses of young writers.
***set** no.1, 1987, item 9.*
Small booklet with an assessment tool for identifying average pupils falling behind in writing.

419 Woolfson, R.
No need for superteachers.
***set** no.1, 1987, item 10*
Planning and commitment count most in running a mainstreamed/integrated class.

420 Smith, P.K. and Boulton, M.
How rough is rough and tumble?
***set** no.1, 1987, item 11.*
Does rough and tumble play lead to violence? Should it be stopped, ignored, or should we join in?

421 Berwick-Emms, P.
Absent and not excused: non-attendance in social perspective.
***set** no.1, 1987, item 12.*
A close look at whose excuses are accepted, whose not. Prejudices uncovered.

422 Johnson, D.W. and Johnson, R.T.
Co-operative learning, computer assisted.
***set** no.1, 1987, item 13.*
Although most classes have only one computer, using it co-operatively is the rule and is further encouraged here.

423 Wilkins, R.
A school discipline strategy.
***set** no.1, 1987, item 14.*
Includes a step by step method for a school to deal with unacceptable behaviour.

424 Knight, T.
Making the leap between learning and doing.
***set** no.1, 1987, item 15.*
Action research programme giving school-leavers responsibility, planning chances, evaluation, to help after school.

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set number 2, 1987

425 Reid, N.
Investing in item banks.
***set** no.2, 1987, item 2.*
How to use item banks to get professional results.

426 Facts about dyslexia.
***set** no.2, 1987, item 3.*
From the USA government magazine *Children Today*.

427 Hutchins, J.
Computer aid for Dyslexics.
***set** no.2, 1987, item 4.*
The 'top-ten' programs are named, and reasons given why some programs are actually harmful.

428 Sampson, S.
Why male control is increasing.
***set** no.2, 1987, item 5.*
Study of legislation and trends in job equity in teaching.

429 Robinson, R.
Are children being indoctrinated?: perceptions of poverty.
***set** no.2, 1987, item 6.*
A Birmingham teacher's examination of social studies teaching, with teaching material appended.

430 Jones, A.
What really happens in the classroom.
***set** no.2, 1987, item 7.*
The researcher tailed two secondary classes for a year. Childen's different notions of what education is resulted in different outcomes.

431 Ramsey, P.D.K., Sneddon, D., Grenfell, J., and Ford, I.
The characteristics of successful schools.
***set** no.2, 1987, item 8.*
Eight NZ primary and secondary schools in matched pairs examined.

432 Berwick-Emms, P.
The tools of your trade: how to manipulate them when you are five years old.
***set** no.2, 1987, item 9.*
How classroom pecking orders are developed, expressed, and the effects.

433 Biggs, J.
Reflective thinking and school learning: an introduction to the theory and practice of metacognition.
***set** no.2, 1987, item 10.*

434 Tasker, G.
What sort of health education?
***set** no.2, 1987, item 11.*
A secondary school survey shows what students ask for. A guide for your own survey included.

435 Renwick, M.
Transition to school: the children's experience.
***set** no.2, 1987, item 12.*

436 Lewis, R.
Different approaches to classroom discipline.
***set** no.2, 1987, item 13.*
Author returned to the classroom from university teaching. His experiences and a review of theories of discipline.

437 Bourke, S.
Pupils talk in maths.
***set** no.2, 1987, item 14.*
Encouraging questions has little measurable effect on learning, but attitudes change and these are important later.

438 O'Rourke, M.
In the playground.
***set** no.2, 1987, item 15.*
Changes in equipment and supervision were tried till some easy-to-organise innovations reduced violence.

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set number 1, 1988

439 Rietveld, C.
Adjusting to school: eight children with Down's Syndrome.
***set** no.1, 1988, item 2.*
Case study of successful mainstreaming/integration.

440 Strong, F.
Mind your language.
***set** no.1, 1988, item 3.*
Help with words and phrases that do not insult the handicapped.

441 Johnson, D. and Johnson, R.
Co-operating learning strategies for mainstreaming/integration.
***set** no.1, 1988, item 4.*

442 Thomas, G.
Room management in mainstream/integrated classrooms.
***set** no.1, 1988, item 5.*
British experience introduces parents and others to help.

443 Openshaw, R.
Schools won't change.
set *no.1, 1988, item 6.*
Author maintains social pressures will squelch change.

444 Lange, D.
Schools will change: commentary.
set *no.1, 1988, item 6.*
NZ Minister of Education justifies his attempts at change.

445 Snook, I.
Vouchers.
set *no.1, 1988, item 7.*
Evidence from places where vouchers have been tried in an attempt to make education more efficient, fairer, and provide more choice.

446 Warr, P.
Work, jobs and unemployment.
set *no.1, 1988, item 8.*
Advice from studies following Sheffield steel works closure on how to lessen psychological effects on school leavers.

447 Wylie, C.
Fair enough?
set *no.1, 1988, item 9.*
Summary of 20 years of educational research on fairness and equality in NZ education. Prepared for a Royal Commission.

448 Elley, W.B.
New vocabulary: how do children learn new words?
set *no.1, 1988, item 10.*

449 Searle, A.
Joys and fears.
set *no.1, 1988, item 11.*
Aboriginal, Torres Strait Islanders and European student teachers asked children about their joys and fears. Cultural learning and ties remain strong.

450 Webber, R.
Step-families.
set *no.1, 1988, item 12.*
Australian research with cheerful advice for teachers.

451 Hay, J.
Teachers and child abuse prevention.
set *no.1, 1988, item 13.*

452 Perrott, C.
Better discussion.
set *no.1, 1988, item 14.*
Case studies and transcripts with comment.

453 Burnham, B.
Homework: a decade of research.
set *no.1, 1988, item 15.*
Review of research from Canada.

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set number 2, 1988

454 Smith, M.L. and Shepard, L.A.
What doesn't work: explaining policies of retention in the early grades.
set *no.2, 1988, item 2.*
Keeping children back (retention) is bad for their academic achievement and social adjustment. A review of research.

455 McDonald, G.
Promotion, retention and acceleration: how the school promotion structure produces inequalities in the face of good intentions.
set *no.2, 1988, item 3.*
Despite good intentions, the New Zealand school promotion structure, by itself, produces inequalities.

456 Schibeci, R.
Scientists in and out of school.
set *no.2, 1988, item 4.*
Stereotypes such as the mad scientist out to rule the world persist in children's minds. How school can help.

457 Lawrence, J.
Youth's judgements about social and ethical issues.
set *no.2, 1988, item 5.*
Development, context and social issues are explored, with advice about how teachers can help.

458 Gray, A.
Teenagers.
set *no.2, 1988, item 6.*
Conclusions from interviews with a hundred of teenagers.

459 Berwick-Emms, P.
What children can get away with.
set *no.2, 1988, item 7.*
Observations of how they disobey class rules, and why.

460 Bernard, M.
Classroom discipline and the effective self-management of teacher stress.
set *no.2, 1988, item 8.*
With checklists and helpful examples.

461 French, P. and Peskett, R.
Talking to control.
set *no.2, 1988, item 9.*
How teachers in infant classes can, and do, use language as an organisational tool.

462 Weintraub, L.
Subversive record keeping.
set *no.2, 1988, item 10.*
Record keeping must have relevance, consent, access, security, information, and not subvert natural justice.

463 McGaw, B.
Overview of issues in school assessment.
set *no.2, 1988, item 11; first published in Best of* ***set****: Assessment; see entry 548s.*

464 Berwick-Emms, P.
I must finish this!
set *no.2, 1988, item 12.*
Quality counts for teachers but most children just want to finish. How to give children the better message.

465 Gow, L.
I taught them but they didn't learn: strategies to encourage the transference of learning.
set *no.2, 1988, item 13.*

466 Toomey, D.
How to help the wrong people.
set *no.2, 1988, item 14.*
Pumping money into a parent-participation project turned out to help the children already ahead. Planning advice.

467 Cullen, J.
Preschool children's learning strategies.
set *no.2, 1988, item 15.*
By discovering what strategies children can manage, the author points out help teachers, and others can give.

468 Young-Loveridge, J.
Number skills in the junior classroom.
set *no.2, 1988, item 16.*
Teachers are good at judging their pupils' skills in mathematics. But some syllabuses are not good.

468b Lealand, G.
National survey of New Zealand journalists: a summary report.
set *no.2, 1988, New Zealand edition only, bonus item.*
Journalists, their characteristics, education, training and professional development.

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set number 1, 1989

469 Snook, I.
Inflated expectations, qualifications and job prospects.
set *no.1, 1989, item 2.*
With unemployment high, extra time at school is not the answer for everyone – advice must be individual.

470 Isaacs, N., Donn, M., Bruhns, H. and Baird, G.
Managing energy in schools.
set *no.1, 1989, item 3.*
Explanations and worksheets for keeping tabs on heating expenditure.

471 Shuker, R.
'I want my MTV.': studying music videos in the classroom.
set *no.1, 1989, item 4.*
Studying the videos that go with rock music can be worthwhile in school.

472 McClellan, V.
Young smokers: rebellion, conformity and imitation.
set *no.1, 1989, item 5.*

473 Ochiltree, G. and Amato, P.
Children's use of the resources families provide.
set *no.1, 1989, item 6.*
Some families provide more resources than others, but even a few resources

can be used well, or many resources used poorly.

474 Orr, E.
'Engineers don't carry handbags.'?!
***set** no.1, 1989, item 7.*
Although girls do better academically at school they do not wind up in better jobs. Research shows how to help.

475 McGee, C.
Crossing the divide: transition from primary to secondary school.
***set** no.1, 1989, item 8.*
Examples of good practice.

476 Lamb, H.
Learning and teaching writing: the IEA Written Composition Study.
***set** no.1, 1989, item 9.*
Lessons from international projects and comparisons.

477 The Seville statement on violence.
***set** no.1, 1989, item 10.*
Twenty university psychologists from East, West, North and South, expose myths, give scientific conclusions.

478 Tye, B.B.
The deep structure of schooling.
***set** no.1, 1989, item 11.*
All high schools in NZ, Australia and the USA are much the same. Why? Can they change? How?

479 Sultana, R.
'What's keeping them back!': life choices and life chances.
***set** no.1, 1989, item 12.*
Life choices are made at school. How can schools lift the burdens from minorities?

480 Benton, R.
Will it hurt?: teaching in Maori and Pitjantjatjara.
***set** no.1, 1989, item 13.*
Schooling in a language other than English in New Zealand and Australia – should it be recommended for minorities?

481 Rowe, H.
Teach learning strategies.
***set** no.1, 1989, item 14.*
Learning facts is not enough. Approaches for teaching learning and thinking strategies.

482 Clarke, Ann and Clarke, Alan
Predicting individual development.
***set** no.1, 1989, item 15.*
A review of research. Teachers can encourage desirable change but individual development is highly unpredictable.

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set number 2, 1989

483 Adey, K.
'A' for accept; 'R' for reject: the alphabet for selecting and promoting teachers.
***set** no.2, 1989, item 2.*
Research shows how job interviews and selection panels can be well run.

484 Williams, T.
Participation in education.
***set** no.2, 1989, item 3.*
The post-school education Australians choose and factors that limit their choice.

485 Jonassen, D.
Pattern notes: a new learning strategy.
***set** no.2, 1989, item 4.*
Two strategies that help learners organise what they are trying to learn, with an analysis of their effectiveness.

486 Wilmore, J.H.
The female athlete.
***set** no.2, 1989, item 5.*
Answers about physiological differences and preparing pupils for vocations with physical demands.

487 Withers, G.
Unlocking the great secret: writing reveals thinking.
***set** no.2, 1989, item 6.*
The techniques of process writing are used to help both children and teachers understand mathematical thinking in problem-solving.

488 Vaughan, G.M.
The psychology of inter-group discrimination.
***set** no.2, 1989, item 7.*
A review of experimental research into prejudice and discrimination.

489 Cameron, J. and Dupuis, A.
Dealing with conflict: mediation programmes in schools.
***set** no.2, 1989, item 8.*
Mediation is a voluntary service to help children and staff resolve inter-personal problems. Includes a case study.

490 Moore, P.A. and St. George, A.
The information quest: a look at children as information seekers.
***set** no.2, 1989, item 9.*
Using pupils' projects as an example, difficulties and ways of overcoming them, in libraries in particular, are shown.

491 Philips, D.
Owning your own writing.
***set** no.2, 1989, item 10.*
Successful teachers of writing observed and their techniques revealed.

492 Mingay, D.
On being insane in sane places.
***set** no.2, 1989, item 11.*
A humorous look at what could happen if you mix sane people – university staff – with psychiatric hospital patients.

493 Atmore, D. and Craig, B.
Exploratory studies in educational computing.
***set** no.2, 1989, item 12.*
Word processing, data bases, videotex, LOGO, handicapped children using computers, and several other studies.

494 Hunting, R.
Beginning to learn fractions.
***set** no.2, 1989, item 13.*
Research with 4- and 5-year-olds suggests good ways to start fractions, other ways to avoid.

495 Gregory, A.
Teaching economics using the media as a resource.
***set** no.2, 1989, item 14.*
Research shows economics matters take up a lot of space and time on the media. Tested techniques for using this.

496 Schaafsma, H.
Networking style: how principals manage curriculum change.
***set** no.2, 1989, item 15.*
Report from seven case studies.

497 Cartoon competition: report on the New Zealand results.
***set** no.2, 1989, bonus item, New Zealand only.*

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set 'specials'

Early Childhood Folio, No.1.

500s Bronfenbrenner, U.
Who cares for children?
*Early childhood folio no.1; previously published in **set** no.2, 1979, item 12; see entry 204.*
An address showing how family change has affected child care.

501s Carnegie Quarterly.
New optimism about pre-school education: three reports from Ypsilanti, Michigan.
*Early childhood folio no.1; previously published in **set** no.2, 1979, item 11; see entry 203.*
Results of studies showing that preschool education is an effective means of helping the educationally disadvantaged.

502s McDonald, G.
Maternal deprivation: fact or fallacy?
*Early childhood folio no.1; previously published in **set** no.1, 1977, item 3; see entry 114.*

503s Smith, P.K.
How many people can a young child feel secure with?
*Early childhood folio no.1; previously published in **set** no.1, 1980, item 7; see entry 216.*
A review of studies of the emotional effects on children of early close relationships with people other than the mother.

504s Jamieson, P.
Who doesn't get to pre-school in Newtown?
*Early childhood folio no.1; previously published in **set** no.1, 1979, item 13; see entry 191.*

484

505s Smith, P.K. and Connolly, K.J.
Playgroup ecology.
Early childhood folio no.1; previously published in **set** *no.1, 1981, item 7; see entry 247.*
The effects of the physical and social environment on preschool children's behaviour.

506s Barney, D.
The pre-school environment: stand off and watch.
Early childhood folio no.1; previously published in **set** *no.2, 1976, item 11; see entry 107.*
A description of observation techniques with examples, case studies and sample recording sheet.

507s Barney, D.
The preschool environment: why are some New Zealand kindergartens so noisy?
Early childhood folio no.1; previously published in **set** *no.2, 1976, item 11; see entry 105.*
Results of a survey for the Auckland Kindergarten Association, naming 10 noise factors, with advice.

508s Day, D.E. and Sheehan, R.
Is open space just empty space?
Early childhood folio no.1; previously published in **set** *no.2, 1976, item 11; see entry 106.*
A study of the physical environment in preschools and effects on children's behaviour.

509s Smith, P.K.
How important is fantasy play?
Early childhood folio no.1; previously published in **set** *no.2, 1982, item 6; see entry 289.*
The role of fantasy play in child development.

510s Jamieson, P.
Second language education of young children.
Early childhood folio no.1; previously published in **set** *no.1, 1977, item 5; see entry 116.*
Acquisition of English as a second language by Tokelau children in NZ.

511s Meade, A.
Don't take that dress off James!: have we got anywhere in trying to remove sex role stereotyping in preschools and junior school classes?
Early childhood folio, no.1; previously published in **set** *no.2, 1981, item 2; see entry 256.*

512s Rithakananone, P., Siemon, D. and Nixon, M.
Young children's ordering behaviour.
Early childhood folio no.1; previously published in **set** *no.1, 1981, item 14; see entry 254.*

513s Meade, A.
Who talks to William?: and Karla, and Susan, and Michael, and...?: adult-child interaction, particularly conversation, in early childhood centres.
Early childhood folio no.1; previously published in **set** *no.1, 1982, item 2; see entry 271.*
Using conversation as an aspect of contact between adults and children in New Zealand preschools.

514s Mitchell, D.
Parents: the untapped resource in special education.
Early childhood folio no.1; previously published in **set** *no.2, 1981, item 10; see entry 265.*
Results of the University of Waikato's Project PATH (Parents as Teachers of the Handicapped).

515s Rosemergy, M.
The importance of being father.
Early childhood folio no.1; previously published in **set** *no.2, 1982, item 5; see entry 288.*
Review of research on the role of the father.

516s Renwick, M.
TV and five year olds: the teacher's view.
Early childhood folio no.1; previously published in **set** *no.2, 1977, item 2; see entry 126.*

517s Meade, A.
Pre-school volunteers.
Early childhood folio no.1; previously published in **set** *no.2, 1978, item 8; see entry 166.*

Parent involvement in preschool education.

Best of *set*: Reading

518s Elley, W.B.
A close look at the Cloze test in assessing readability.
Best of **set**: *reading, 1985, item 2; previously published in* **set** *no.1, 1977, item 2; see entry 113.*

519s Thompson, B.
Reading words with context and without.
Best of **set**: *reading, 1985, item 3; previously published in* **set** *no.2, 1981, item 9; see entry 264.*

520s Corballis M.
The neuropsychology of reading.
Best of **set**: *reading, 1985, item 4; previously published in* **set** *no.1, 1985, item 8; see entry 364.*
Brain injury research has led to new insights.

521s Pohl, H.
What do we know about adolescent reading?
Best of **set**: *reading, 1985, item 5; previously published in* **set** *no.2, 1983, item 14; see entry 327.*
Explains different theories of reading.

522s Johnson, B.
Assessing attitudes to reading: what can teachers do?
Best of **set**: *reading, 1985, item 6; previously published in* **set** *no.2, 1979, item 6; see entry 198.*

523s Nicholson, T.
The confusing world of high school reading: what the teacher doesn't see.
Best of **set**: *reading, 1985, item 7; previously published in* **set** *no.1, 1984, item 14; see entry 342.*
The problems of lack of comprehension in reading, and its effects across the curriculum.

524s Nicholson, T.
The confusing world of high school reading, part 2: how the teacher can see.
Best of **set**: *reading, 1985, item 8; previously published in* **set** *no.2, 1984, item 5; see entry 347.*
Techniques teachers can use to discover the extent of lack of comprehension in reading.

525s Nicholson, T.
Putting the answer before the question: a new way of understanding reading comprehension.
Best of **set**: *reading, 1985, item 9; previously published in* **set** *no.2, 1979, item 4; see entry 196.*

526s Baddeley, A.
Reading and working memory.
Best of **set**: *reading, 1985, item 10; previously published in* **set** *no.1, 1984, item 11; see entry 339.*
Research into the use of short-term memory, and its effect on learning to read.

527s Stevenson, B. and Ralston, F.
Reading together: parents helping at school.
Best of **set**: *reading, 1985, item 11; previously published in Australian* **set** *no.1, 1981, item 16; see entry 256a.*

528s Wagner, G.
Using readability formulas in the classroom.
Best of **set**: *reading, 1985, item 12; previously published in* **set** *no.1, 1981, item 13; see entry 253.*

529s Anderson, J.
Reading: to test or not to test?
Best of **set**: *reading, 1985, item 13; previously published in Australian* **set** *no.1, 1981, item 5; see entry 245a.*
How to use reading tests most effectively.

530s Vincent, D.
Reading ages and reading tests.
Best of **set**: *reading, 1985, item 14; previously published in Australian* **set** *no.2, 1981, item 4; see entry 259a.*

531s Robinson, V., Glynn, T., McNaughton, S. and Quinn, M.
Parents as remedial reading tutors:

a report on the work of the Mangere Home and School Project.
Best of ***set****: reading, 1985, item 15; previously published in* ***set*** *no.2, 1979, item 3; see item 195.*

532s Makins, V.
In the real world you can't say cereal when you mean shampoo.
Best of ***set****: reading, 1985, item 16; previously published in* ***set*** *no.1, 1978, item 9; see entry 148.*
A review of Frank Smith's seminal studies of how children learn to read.

533s Brooks, A.
Reading through the little screen.
Best of ***set****: reading, 1985, item 16; previously published in* ***set*** *no.1, 1978, item 9; see entry 149.*
An outline of TV-related reading programmes.

534s Glynn, T., McNaughton, S., Robinson, V. and Quinn, M.
Remedial reading at home: helping you to help your child.
Best of ***set****: reading, 1985, bonus item; previously published in* ***set*** *no.2, 1979, bonus item; see entry 208.*

Early Childhood Folio No.2.

535s Lawrence, P.
Jean Piaget in retrospect.
Early childhood folio no.2, 1986; previously published in ***set*** *no.1, 1983, item 7; see entry 305.*

536s Sylva, K.
A hard-headed look at the fruits of play.
Early childhood folio no.2, 1986; not previously published.
Three research projects on the value of children's play and the optimum play environment.

537s Tizard, B.
What Joyce learnt from her mother.
Early childhood folio no.2, 1986; previously published in ***set*** *no.2, 1985, item 8; see entry 377.*
Talk at home may be very different from that at school, and better teaching. Assumptions about potential from school behaviour can be quite wrong.

538s Cubey, P.
What happens when a child starts school?: three books and three projects reviewed.
Early childhood folio no.2, 1986; previously published in ***set*** *no.1, 1984, item 4; see entry 332.*

539s Meade, A. and Staden, F.
Once upon a time, amongst blocks and car cases... action research to enable girls' mathematics learning.
Early childhood folio no.2, 1986; previously published in ***set*** *no.2, 1985, item 5; see entry 374.*
Action research on preschool mathematical experiences for girls.

540s Rossiter, A.
Difficult-to-teach junior school children.
Early childhood folio no.2, 1986; previously published in ***set*** *no.2, 1983, item 9; see entry 322.*

541s Podmore, V. and Bird, L.
Taking care of themselves: children can do more than we think.
Early childhood folio no.2, 1986; previously published in ***set*** *no.2, 1986, item 9; see entry 405.*
At five years old children know a lot about how to keep well.

542s Meade, A.
After school, and in the holidays.
Early childhood folio no.2, 1986; previously published in ***set*** *no.1, 1984, item 2; see entry 330.*
Results and suggestions from a Wellington survey of after-school and holiday care for the children of working parents.

543s Rosemergy, M. and Meade, A.
Family networks: who cares for the caregiver while the caregiver's caregiving?
Early childhood folio no.2, 1986; previously published in ***set*** *no.2, 1986, item 2; see entry 398.*

544s Morris, B.
It was good fun getting here, but what do I do now?: a survey of

those who hold the New Zealand Playcentre National Supervisors Certificate.
*Early childhood folio no.2, 1986; previously published in **set** no.2, 1983, item 4; see entry 316.*

545s Renwick, M.
Teachers College students who are also parents.
*Early childhood folio no.2, 1986; previously published in **set** no.2, 1984, item 3; see entry 345.*
The comments of student-parents on their teachers' college training, from their viewpoint as parents.

546s McMillan, B., and Meade, A.
Observation: the basic techniques.
*Early childhood folio no.2, 1986; previously published in **set** no.1, 1985, item 7; see entry 363.*
Handbook for classroom and pre-school researchers.

547s McDonald, G.
The use of video recording for the study of young children.
*Early childhood folio no.2, 1986; previously published in **set** no.1, 1987, item 5; see entry 414.*
A guide to using this new research technique.

Best of *set:* Assessment

548s McGaw, B.
Overview of issues in school assessment.
*Best of **set**: assessment, 1987; later published in **set** no.2, 1988, item 11; see entry 463.*
A discussion of the purposes, qualities, forms and content of assessment.

549s Turnbull, W.
Achievement test scores in perspective.
*Best of **set**: assessment, 1987; previously published in **set** no.1, 1981, item 12; see entry 252.*
Discusses what the standardized achievement test can and cannot do.

550s Croft, C.
The foundations of school testing.
*Best of **set**: assessment, 1987; previously published in **set** no.2, 1980, item 8; see entry 233.*

551s Croft, C.
Test evaluation sheet.
*Best of **set**: assessment, 1987; previously published in **set** no.2, 1980, item 9; see entry 234.*
A checklist for evaluating the validity, reliability and usability of a test; designed for use with item 8.

552s Elley, W.B.
Assessing what they've learned.
*Best of **set**: assessment, 1987; previously published in **set** no.1, 1980, item 13; see entry 223.*
A guide to classroom testing.

553s Rowley, G. and Macpherson, C.
Criterion-referenced measurement.
*Best of **set**: assessment, 1987; previously published in **set** no.1, 1983, item 11; see entry 309.*
Explanation of criterion-referenced tests and their uses.

554s Reid, N.
Investing in item banks.
*Best of **set**: assessment, 1987; previously published in **set** no.2, 1987, item 2; see entry 425.*
How to use item banks to get professional results.

555s Gilmore, A.
Combining scores.
*Best of **set**: assessment, 1987; previously published in **set** no.2, 1981, item 8; see entry 263.*
When combining scores from several tests or several subjects the pitfalls are many. Worked examples show what is legitimate, what is invalid.

557s Philips, D.
Evaluating writing.
*Best of **set**: assessment, 1987; previously published in **set** no.1, 1982, item 13; see entry 282.*

558s McMillan, B. and Meade, A.
Observation: the basic techniques.
*Best of **set**: assessment, 1987; previously published in **set** no.1, 1985,*

item 7; see entry 363.
Eight techniques for use by teachers in classrooms as well as researchers. Most examples are from early childhood centres but the techniques are widely applicable.

559s Withers, G.
One extreme to the other: a report on profile reports.
*Best of **set**: assessment, 1987; previously published in **set** no.1, 1987, item 4; see entry 413.*
Profile reports described and evaluated.

560s Croft, C.
Non-verbal tests in schools.
*Best of **set**: assessment, 1987; previously published in **set** no.2, 1982, item 7; see entry 290.*

561s Jenkinson, J.
Does intelligence equal learning ability?
*Best of **set**: assessment, 1987; previously published in **set** no.1, 1981, item 10; see entry 250.*

562s Reid, N. and Gilmore, A.
Test bias! : test bias?
*Best of **set**: assessment, 1987; previously published in **set** no.2, 1983, item 16; see entry 329.*
Examines types of test bias, and ways of dealing with them.

Best of *set*: Discipline

563s Stearman, H.
What do parents think?
*Best of **set**: discipline, 1989, item 2; not previously published.*
Should children become involved in classroom discipline policy? The wishes of parents are not always in full agreement with teachers or with government policy.

564s Lewis, R.
Different approaches to classroom discipline.
*Best of **set**: discipline, 1989, item 3; previously published in **set** no.2, 1987, item 13; see entry 436.*
Author returned to the classroom from university teaching. His experiences and a review of theories of discipline.

565s Rossiter, A.
Difficult-to-teach junior school children.
*Best of **set**: discipline, 1989, item 4; previously published in **set** no.2, 1983, item 9; see entry 322.*

566s Dobson, J. and Gale, R.
Corporal punishment: help for teachers.
*Best of **set**: discipline, 1989, item 5; previously published in **set** no.1, 1985, item 5; see entry 361.*
Includes 22 alternatives from the British Psychological Society.

567s Anderson, L.S.
The aggressive child.
*Best of **set**: discipline, 1989, item 6; previously published in **set** no.2, 1978, item 5; see entry 163.*

568s Lovegrove, M., Lewis, R. and Burman, E.
Pupils prefer.
*Best of **set**: discipline, 1989, item 7; not previously published.*
Research in Australia, NZ, USA and Norway shows that pupils prefer discipline that has been democratically developed.

569s Bernard, M.
Classroom discipline and the effective self-management of teacher stress.
*Best of **set**: discipline, 1989, item 8; previously published in **set** no.2, 1988, item 8; see entry 460.*
With checklists and helpful examples.

570s O'Rourke, M.
In the playground.
*Best of **set**: discipline, 1989, item 9; previously published in **set** no.2, 1987, item 15; see entry 438.*
Changes in equipment and supervision were tried till some easy-to-organise innovations reduced violence.

571s Crittenden, B.
School discipline.
*Best of **set**: discipline, 1989, item 10;*

not previously published.
Freedom, authority, rights, justice, ideals, rules, punishment, morality, and the law, all need attention.

572s Wilkins, R.
Classroom management.
Best of ***set****: discipline, 1989, item 11; previously published in* ***set*** *no.2, 1983, item 12; see entry 325.*

573s Wheldall, K. and Merrett, F.
Managing troublesome behaviour.
Best of ***set****: discipline, 1989, item 12; not previously published.*
What teachers do, the strategies they use, behaviour modification techniques, and case studies.

574s Balson, M.
Discipline: an old problem in a new world.
Best of ***set****: discipline, 1989, item 13; previously published in Australian* ***set*** *no.2, 1985, item 2; see entry 371a.*
How teachers can apply individual psychology in the classroom.

575s Knight, T.
A democratic apprenticeship in the primary school.
Best of ***set****: discipline, 1989, item 14; not previously published.*
How a Melbourne school involved the whole community in making its own school code of behaviour.

576s McDaniel, T.
'Well begun is half-done': a school wide project for better discipline.
Best of ***set****: discipline, 1989, item 15; previously published in* ***set*** *no.1, 1983, item 9; see entry 307.*
This project in South Carolina succeeded; the article shows why.

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set number 1, 1990

577 Bassett, G.
Children and superstars of wrestling.
set *no.1, 1990, item 2.*
Is watching such 'violent' programmes doing children harm?

578 Church, J.
Behaviour disordered children.
set *no.1, 1990, item 3.*
Identifying 'out-of-control', socially maladjusted, delinquent children and then getting changes.

579 Kelly, K.
Let someone else deal with them.
set *no.1, 1990, item 4.*
Do alternative schools for truants and offenders (New Zealand 'Activity Centres') work? A case study.

580 Fillmore, L.W.
Diverse society; diverse education?
set *no.1, 1990, item 5.*
Californian experience and research on teaching children with diverse languages and diverse cultural attitudes to education.

581 Smith, P.K. and Ahmad, Y.
The playground jungle: bullies, victims and intervention strategies.
set *no.1, 1990, item 6.*
Research from Norway and Britain. Bullying is more common than we care to admit. How to successfully intervene.

582 Grant, B. and Olson, J.
Looking inside the physical education lesson.
set *no.1 1990, item 7.*
Checking the benefits; research results and a research programme for teachers to use.

583 Podmore, V.
Junior school class size: where are we now?
set *no.1, 1990, item 8.*
A review of research on the effects of class size on children's academic success and behaviour, teacher stress, cost effectiveness and the unique characteristics of small classes.

584 Rowe, K.
What are the benefits of single-sex maths classes?
set *no.1, 1990, item 9.*
A very carefully run experiment in Ballarat High School shows definite benefits for similar schools. With critical comments.

585 Watson, C.
For adolescent eyes only.
set *no.1, 1990, item 10.*
Adolescents delight in 'Low Culture' Films such as *Police Academy.* These films are full of lessons and are ideal teaching material.

586 Bakopanos, V. and White, R.
Increasing meta-learning, part 1: encouraging students to ask questions.
set *no.1, 1990, item 11.*
Children should learn how to learn. A case study of successful teaching for meta-learning. A second appears in *set no.2, 1990,* see entry 599.

587 Spear, M.
Inflated marks.
set *no.1, 1990, item 12.*
Teachers often give marks higher than the quality of the work requires. The reasons are good but does it pay off?

588 McGregor, M.
Rescaling school-based assessments.
set *no.1, 1990, item 13.*
Marks interfere with each other – a brilliantly fair assessment may be greatly altered by other equally just marks.

589 Marland, E. and Richards, L.
The *set* Index
set *no.1, 1990, item 14.*

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set number 2, 1990

590 McClellan, V., Leibrich, J., Bradshaw, J. and Neale, J.
Modified sports: Kiwi and Aussie.
set *no.2, 1990, item 2.*
Child sized equipment and modified rules develop skills and give great fun.

591 Flynn, J. with comments by Raven, J.
IQ tests and cultural distance.
set *no.2, 1990, item 3.*
Dutch children do 20% better than their parents on IQ tests. But schools don't report a flood of geniuses and exam scores fall. These and other puzzles are addressed.

592 Fisher, D. and Fraser, B.
School climate: assessing and improving school environments.
set *no.2, 1990, item 4.*
Assessing a school's climate, its personality, its spirit, its own culture and improve it? With details and case studies this item introduces the next.

593 Fisher, D. and Fraser, B.
School level environment questionnaire (SLEQ).
set *no.2, 1990, item 5.*
A 100 item questionnaire is for photocopying and use. It shows which parts of a school's life can be changed for the better, and checks that it happens.

594 McKenzie, P.
Size, costs, curriculum in secondary schools.
set *no.2, 1990, item 6.*
Some small schools, despite received wisdom, provide a better range of subjects than big ones, but tiny schools will always be expensive to run.

595 Callister, P. with a brief reply by Snook, I.
Education and employment.
set *no.2, 1990, item 7.*
A Planning Council economist sees market forces, plus education, as the only route to well paid, sustainable, full employment. Professor Snook says the figures don't back up the dogma.

596 Dewalt, M.
Good and bad in prime time TV for kids.
set *no.2, 1990, item 8.*
We can count all the shootings and violence on the TV we let our children watch. But what about the good things they see? More counting reveals interesting facts.

597 Gallagher, T.
Girls are better than boys?
set *no.2, 1990, item 9.*
In Northern Ireland it was assumed that boys would catch up to girls at school. But the courts said treating them differently must stop. Where does that leave us?

598 English, L.
Small children solve big problems.
set *no.2, 1990, item 10.*
5- and 6-year-olds can solve problems some syllabuses assume they cannot. Encouragement to aim high.

599 Swan, S. and White, R.
Increasing meta-learning part 2: thinking books.
set *no.2, 1990, item 11.*
Children should learn how to learn. A second example of how it can be encouraged. The first was Item 11 in *set no.1, 1990*, see entry 586.

600 Cameron, M., Grudnoff, L., Gwilliam, M. and Peddie, R.
Finding your first job: from college to classroom under new rules.
set *no.2, 1990, item 12.*
The way beginning teachers find jobs, or are directed into them, are very different, country to country, state to state. Here a system, at the 'market-forces' end of the spectrum, is assessed.

601 Badger, B. and O'Hare, E.
Weather and wickedness.
set *no.2, 1990, item 13.*
The weather does have an effect on children's (mis)behaviour. Evidence from Britain results in a predictive formula.

602 Lane, P.
Lessons from Mrs A. and Mrs P.
set *no.2, 1990, item 14.*
The way infant children learnt some new maths was matched with the way their teachers taught.

603 Barnhart-Thomson, G.
Teenage perceptions in a still nuclear age.
set *no.2, 1990, item 15.*
In 1985 88 percent of students in an average high school thought there would be a devastating war in their lifetimes. A follow-up study of changing perceptions.

604 Alton-Lee, A., Densem, P. and Nuthall, G.
'I only think of the men...I don't think of the women'.
set *no.2, 1990, item 16.*
As they did ordinary class work, teacher and children were observed, and every word recorded. From this mountain of data come startling and disturbing facts.

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set **number 1, 1991**

606 Sellers, A.H. and Blong, R.
The greenhouse effect.
set *no.1, 1991, item 2.*
What school pupils know already about the changes to climate, environment, economies, and life style that the greenhouse effect is bringing. Research shows we have the basic facts, but need discussion of the consequences.

607 Gerritsen, T.
Children's attitudes to the natural environment.
set *no.1, 1991, item 3.*
Observing at school camps gives a brief picture of how attitudes can be improved.

608 Holmes, S. and Hanley, P.; Jackson, M.
Teaching money making.
set *no.1, 1991, item 4.*
Two articles, the first on school-based enterprises and the changes which research suggests: the second a report from Britain called 'Impoverished by the need to make money.'

609 Morton, J.
How young pupils' memories work.
set *no.1, 1991, item 5.*
The latest clues come from a walk in the park and an owl at pre-school. Insights to adjust the learning we ask of children and the way we assess what has been learnt.

610 Dominowski, R. and Buyer, L.
Solving – not solving.
set *no.1, 1991, item 6.*
Being told the answer can actually stop you remembering it. When and how the answer is given is very important.

611 Still, R.
Working with children who have a

life-threatening illness.
***set** no.1, 1991, item 7.*
Practical advice from research.

612 Miller, S., Leinhardt, G., Zigmond, N.
Accommodating at-risk pupils.
***set** no.1, 1991, item 8.*
Most high schools 'bend the rules' for some pupils. The results are mixed.

613 Peddie, R.
What do teachers do all day?
***set** no.1, 1991, item 9.*
Despite school finishing at 3.30 teachers are busy people. When syllabus and assessment changes are added, the load can be even worse. Diaries and case studies.

614 Munn, P. and Stephenson, J.
From disadvantaged to advantaged.
***set** no.1, 1991, item 10.*
If you left school without much in the way of formal qualifications, how do you get back to study? A 'bridging' course carefully examined.

615 Marc, D.
A role for print literacy in a free communications market?
***set** no.1, 1991, item 11.*
Does reading have to be carefully protected against the avalanche of television? Is driving as much a threat to reading-for-enjoyment as TV? A lively discussion of such topics.

616 Rogers, B.
Dealing with procrastination.
***set** no.1, 1991, item 12.*
The techniques of 14-year-old Wayne and his partners dealt with.

617 Boylan, C., Battersby, D., Wallace, A., Retallick J. and Edwards, J.
Exemplary teaching.
***set** no.1, 1991, item 13.*
What makes a really good teacher? Two case studies.

618 McGilp, J.
Parents teaching in schools.
***set** no.1, 1991, item 14.*
Parents with particular skills taught. Teachers' fears of losing control and of poor teaching were unfounded.

619 Carr, K. and Ritchie, G.
Evaluating learning in mathematics.
***set** no.1, 1991, item 15.*
Norm based, mastery based and interview techniques researched. Problems with each are faced and alternatives discussed.

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set number 2, 1991

620 Stevenson, J. and De Fries, J.C.
Twin studies of spelling.
***set** no.2, 1991, item 2.*
Genetic studies plus advice.

621 Rosen, J.
Moment-by-moment decisions.
***set** no.2, 1991, item 3.*
Self observation reveals ways of getting better control of the quick decisions every teacher has to make.

622 Wober, M.
TV and homework.
***set** no.2, 1991, item 4.*
Research from audience surveys in the UK.

623 Cameron, M., Depree, H., Walker, J. and Moore, D.
Paired writing: helping beginning writers get started.
***set** no.2, 1991, item 5.*
Getting help from peers can make up for missing attention from teachers. Giving help also improves the young tutor's work.

624 Parr, J.
Evaluation of the process of writing.
***set** no.2, 1991, item 6.*
How you assess partly depends on your notion of what writing is for. But the accuracy of the assessment depends on clearly distinguishing different characteristics.

625 Briggs, F.
Keeping ourselves safe.
***set** no.2, 1991, item 7.*
An examination of Australian and North American programmes, and a New Zealand programme, for 'personal safety.'

626 MacCallum, J.
Does the moral judgement of teachers really matter?
***set** no.2, 1991, item 8.*

A Western Australian programme is called 'Managing Student Behaviour.' Questionnaires revealed levels of moral judgement before and after the in-service section.

627 Archer, J.
Encouraging creativity.
***set** no.2, 1991, item 9.*
Creativity in poetry can be measured, and reliably. But encouraging creative poetry is a subtle business.

628 McConnell, R.
Poetry, poets and teaching poetry.
***set** no.2, 1991, item 10.*
Robin McConnell asked poets as well as teachers for their comments. Many clear bits of advice.

629 Kenny, D.
Is more of the same better?
***set** no.2, 1991, item 11.*
Many anxious parents ask teachers if their child should repeat a year. Against popular opinion, the long term effects are nil, and the child is a year behind his or her peers.

630 Crocker, A.C. and Cheeseman, R.G.
Knowing your place.
***set** no.2, 1991, item 12.*
If people approve of us, then we approve of ourselves – our self-esteem grows. Research on the ability of young children to rank themselves for academic ability.

631 Baker, R.
Out of the frying pan...
***set** no.2, 1991, item 13.*
What makes one student successful in his or her first year of university study, and another struggle or fail? Recommendations for both the students and their secondary schools.

632 McDonald, G. and Kidman, J.
Ten days in new entrant classrooms.
***set** no.2, 1991, item 14.*
Video-recordings of new entrants busily adjusting to school learning can be replayed and analysed. Insights into learning, interaction and classroom climate.

633 Mitchell, D., Lowden, G. and Crouse, W.
Designing and evaluating programmes for students with special needs in secondary schools.
***set** no.2, 1991, item 15.*
Integration/mainstreaming brings new demands and requires new criteria for creating (and judging) quality education. Research reveals good practice.

634 Podmore, V.
Fencing in, turning down, and belting up.
***set** no.2, 1991, item 16.*
The best ways of preventing and coping with injuries to small children.

Best of *set*: Writing

635s Philips, D.
Introduction.
*Best of **set**: Writing, 1991; not previously published.*
A short essay on where worldwide research has got to, and of the relevance of the research in *Best of **set**: Writing.*

ACQUISITION AND DEVELOPMENT

636s Giacobbe, M.E.
Kids can write the first week of school.
*Best of **set**: Writing, 1991; previously published in **set** no.2, 1981, item 7; see entry 262.*
Useful, and exciting, research results about her own class. Research every teacher can do.

637s Gentry, R.
Spelling genius at work.
*Best of **set**: Writing, 1991; previously published in **set** no.2, 1983, item 10; see entry 323.*
The development of a child's written language from 4-years-old to 10. Glenda Bissex's book, *GNYS AT WRK* reviewed.

638s Philips, D.
Six weeks writing in two secondary school classrooms.
*Best of **set**: Writing, 1991; previously published in **set** no.1, 1986, item 12; see entry 396.*

A picture of writing across the curriculum.

TEACHING ISSUES

639s Simmonds, K.
A working knowledge.
*Best of **set**: Writing, 1991.*
Despite having no grammatical vocabulary, 12-year-olds have an excellent working knowledge of language.

640s Elley, W., Barham, I., Lamb, H. and Wyllie, M.
Does instruction in English grammar improve writing skills?
*Best of **set**: Writing, 1991; previously published in **set** no.1, 1975, item 7; see entry 77.*
Three contrasting approaches to grammar were used, over three years, in separate matching classes in a large secondary school.

641s Philips, D.
Encouraging writing.
*Best of **set**: Writing, 1991; previously published in **set** no.2, 1983, item 11; see entry 324.*
A smorgasbord of techniques, all based on research, with explanations, practical advice and references for further reading and study.

642s Snyder, I.
Writing with word processors.
*Best of **set**: Writing, 1991.*
The computer's impact on writing quality, researched with 13-year-olds using both word processors and traditional pen and paper.

643s Philips, D.
Owning your own writing.
*Best of **set**: Writing, 1991; previously published in **set** no.2, 1989, item 10; see entry 491.*
How 60 most successful teachers got such good work from their pupils.

644s Withers, G.
Unlocking the great secret.
*Best of **set**: Writing, 1991; previously published in **set** no.2, 1989, item 6; see entry 487.*
Maths teaching using the techniques of Process Writing to help both children and teachers understand how thinking solves problems.

ASSESSMENT

645s Farmer, I. and Dixon, J.
Staging points in personal narrative.
*Best of **set**: Writing, 1991; previously published in **set** no.1, 1986, item 13; see entry 397.*
Studying 8- to 13-year-olds' writing over a year revealed certain features which appeared again and again. Stages to look for as abilities develop. Many examples.

646s Philips, D.
Evaluating writing.
*Best of **set**: Writing, 1991; previously published in **set** no. 1, 1982, item 13; see entry 282.*
The best marking techniques for day-to-day course-work writing and end-of-term assessments, including a checklist of important points.

647s Parr, J.
Evaluation of the process of writing.
*Best of **set**: Writing, 1991; previously published in **set** no.2, 1991, item 6; see entry 624.*
How you assess partly depends on your notion of what writing is for. But the accuracy of the assessment depends on clearly distinguishing different characteristics.

648s Adler, C.
Writers at risk.
*Best of **set**: Writing, 1991; previously published in **set** no.1, 1987, item 9; see entry 418.*
Identifying and helping children of average intelligence who fall further and further behind in writing.

649s Lamb, H.
Learning and teaching writing.
*Best of **set**: Writing, 1991; previously published in **set** no.1, 1989, item 9; see entry 476.*
An analysis of six thousand children's letters, stories, arguments and reflections for the IEA programme. It gives a picture of the children themselves, and helps teachers match techniques and goals.

650s Woods, C.
Taking care of the elements.
*Best of **set**: Writing, 1991; not previously published.*
In South Australia the performance of 11- and 12-year-olds as writers was assessed.

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set number 1, 1992

651 Edwards, W.
Appraising teachers.
***set** no.1, 1992, item 2.*
Appraisal for **firing** (helps administrators only) and appraisal for **fixing** (helps the teacher and the school).

652 Bastow, B.
How to single out a school.
***set** no.1, 1992, item 3.*
Parents look for the 'best' school for their children. Can a school change itself? Advertising your wares may be more like selling soap than knowledge.

653 Karmiloff-Smith, A.
Success is not enough.
***set** no.1, 1992, item 4.*
There is a stage about the time children start school, when earlier 'success' is followed by 'failure' at the same tasks. When success comes again, it is a huge jump ahead. Junior school maths, physics and language examples.

654 Smith, F.
In the company of authors.
***set** no.1, 1992, item 5.*
A thoughtful, if opinionated, account by a reading guru of how continued success in reading can be achieved.

655 Donnelly, P.
Thx rxxl bxxks dxbxtx xs pxxntlxss.
***set** no.1, 1992, item 6.*
A point is made in the debate about 'real books' and 'phonics'.

656 Dymock, S.
Reading but not understanding.
***set** no.1, 1992, item 7.*
There are a small number of children who can sound out every word and make it all sound sensible, but who understand very little of what they have 'read'.

657 Townsend, M.
Titular colonicity and scholarship revisited: research and scholarly impact.
***set** no.1, 1992, item 8.*
Some titles have colons in them, some don't. Do colons point to better articles? Better research? Or just pomposity?

658 Graves, M. and Slater, W.
Memorable text.
***set** no.1, 1992, item 9.*
The way in which the textbooks are written makes a big difference to how much is remembered.

659 Twitchin, R.
Fact + fiction = faction.
***set** no.1, 1992, item 10.*
Television often blends documentary (fact) and drama (fiction). Children have difficulty in separating fact from opinion in such programmes.

660 Watson, A.
'Our teachers never come back after Christmas.'
***set** no.1, 1992, item 11.*
What makes for a satisfied, stable, teaching force? What can principals and administrators do?

661 Batten, M.
Senior secondary school courses.
***set** no.1, 1992, item 12.*
Two different courses which provide diversity, involvement and success for students not going on to tertiary education.

662 Okano, K.
From school to work in Japan.
***set** no.1, 1992, item 13.*
The examination of a system very different to that in New Zealand and Australia.

663 Hughes, D. and Lauder, H.
A great waste of talent.
***set** no.1, 1992, item 14.*
Careful analysis of where school leavers go reveals that many who have the ability to benefit from a university education do not get one.

664 Wilson, C. and Dupuis, A.
Poverty and performance.
set *no.1, 1992, item 15.*
Children from homes with little money do not **always** fail, but it is usual. Three groups in one high school compared.

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set number 2, 1992

665 Dickinson, K.
Teasing and bullying.
set *no.2, 1992, item 2.*
A simple research project by a school guidance officer led to a new all-school approach which works.

666 Greene, J.
Senior school maths, university style.
set *no.2, 1992, item 3.*
Lectures, followed by class-sized tutorials, not all compulsory. A report on how a school checked the scheme's success.

667 Frith, U.
Holes in the mind: cognitive development and cognitive deficit.
set *no.2, 1992, item 4.*
Dyslexia and autism are both examples of cognitive deficits; both may be encountered in mainstreamed or integrated classes. Help with understanding and helping.

668 Catania, C., Matthews, B. and Shimoff, E.
Rules, rules, rules.
set *no.2, 1992, item 5.*
Most of what we do is governed by rules we pick up, not experiences we have. A review of these researchers' discoveries.

669 Martin, T. and Church, J.
The co-operative reading resource.
set *no.2, 1992, item 6.*
140 reading books use peer tutoring to boost slow readers. The resource is explained, and the research that revealed its power.

670 Moore, B. and Lumelume, S.
***Ready to read* in the South Pacific.**
set *no.2, 1992, item 7.*
A new approach to the teaching of English, using books not specifically designed for second-language learners.

671 Corson, D.
Teaching in a multi-ethnic school.
set *no.2, 1992, item 8.*
This article reviews a large body of research on different policy approaches. Bi-lingual and second-language teaching are particularly noted.

672 Wood, P.
Teaching our students: adapting teaching styles to cultural and class differences.
set *no.2, 1992, item 9.*
Classroom research suggests new ways of looking at the differences. Includes a section on what to do now.

673 Teacher Evaluation Form – Socrates
set *no.2, 1992, item 10.*
A modern evaluation form filled in for the most famous teacher of all.

674 Raven, J.
The crisis in education.
set *no.2, 1992, item 11.*
Education systems should foster the competencies that make for enterprise. However, the barriers that need to be overcome are surprising.

675 Cook, J. and Wilson, J.
Kindergarten children who cause concern.
set *no.2, 1992, item 12.*
For up to 20 percent of children, learning spontaneously is interrupted by their *own* behaviour. Strategies to help.

676 Thomas, G.
Helping one another learn.
set *no.2, 1992, item 13.*
Very young children's ability to help one another in mathematics is examined.

677 Higgins, J.
Can I help? I'll be your friend.
set *no 2, 1992, item 14.*
The extent of very young children's social interplay and learning about

friendship and relationships, even whilst doing mathematics.

678 Cameron, M. and Grudnoff, L.
set no.2, 1992, item 15.
From college to ... ?
In 1990 the way beginning teachers got a job in New Zealand was completely changed. (see entry 600). The latest figures are analysed and principals asked how the system is working.

Best of *set*: Junior Classes

679s Richards, L.
Contents, and further reading.
*Best of **set**: Junior Classes, 1992.*

HOW CHILDREN LEARN

680s Morton, J.
How young pupils' memories work.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.1, 1991, item 5; see entry 609.*
The latest insights into memory come from a walk in the park and an owl at pre-school. Help to adjust the learning we ask of children to what they can manage.

681s Elley, W.
New vocabulary: how do children learn new words?
*Best of **set**: Junior Classes, 1992; previously published in **set** no.1, 1988, item 10; see entry 448.*
Most children learn 1000 new words each year. But no teacher teaches that many deliberately. Activities which promote new vocabulary.

682s Karmiloff-Smith, A.
Success is not enough.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.1, 1992, item 4; see entry 653.*
There is a junior-school stage when 'success' is followed by 'failure' at the same tasks. This is, however, progress. Maths, physics and language examples are explained.

SOCIAL INTERACTION AND LEARNING

683s McDonald, G. and Kidman, J.
Ten days in new entrant classrooms.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1991, item 14; see entry 632.*
Video-recordings of new entrants busily adjusting to school learning can be replayed and analysed. Insights into learning, interaction and classroom climate.

684s Berwick-Emms, P.
The tools of your trade: how to manipulate them when you are five years old.
*Best of **set**: Junior Classes, 1992; previously published in **set** no. 2, 1987, item 9; see entry 432.*
Social incidents keep some children at the bottom of the pecking order and not learning efficiently. How can children, and teacher, cope?

685s Berwick-Emms, P.
I must finish this.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1988, item 12; see entry 464.*
Quality counts for teachers, but most children just want to finish. Teachers can help by uncovering skills children already enjoy.

PROMOTION

686s McDonald, G.
Promotion, retention and acceleration.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1988, item 3; see entry 455.*
Despite good intentions, the school promotion structure, by itself, produces inequalities. How this comes about, who suffers, and what to do about it.

WRITING AND MATHEMATICS

687s Cameron, M., Depree, H., Walker, J. and Moore D.
Paired writing: helping beginning writers get started.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1991, item 5; see item 623.*
Getting good writers to help poor writers helps both, and the busy teacher.

688s Young-Loveridge, J.
Number skills in junior classrooms.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1988, item 16; see entry 468.*
Teachers are very good at judging children's mathematical knowledge and skills. But parts of the present syllabii hinder maximum learning progress.

689s English, L.
Small children solve big problems.
*Best of **set**: Junior Classes, 1992; previously published in **set** no. 2, 1990, item 10; see entry 598.*
This evidence of abstract thought and mathematical problem-solving encourages everyone to aim high.

690s Hunting, R.
Beginning to learn fractions.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1989, item 13; see entry 494.*
Ways of introducing fractions so that the natural instincts of the children in sharing and counting are built upon.

WIDER ISSUES

691s Renwick, M.
Transition to school: the children's experience.
*Best of **set**: Junior Classes, 1992; previously published in **set** no. 2, 1987, item 12; see entry 435.*
Children, parents, and teachers all regard school as a place where you learn by doing real work. And children, though usually excited, also worry.

692s Briggs, F.
Keeping ourselves safe.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1991, item 7; see entry 625.*
An examination of Australian, North American, and a very successful New Zealand programme on 'personal safety' which starts in the junior school.

693s Podmore, V.
Junior school class size: where are we now?
*Best of **set**: Junior Classes, 1992; previously published in **set** no.1, 1990, item 8; see entry 583.*
This review of the research looks at the effects of class size on academic success, children's behaviour, teacher stress, cost effectiveness and the unique characteristics of small classes.

694s Crocker, A.C. and Cheesman, R.G.
Knowing your place.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1991, item 12; see entry 630.*
The way junior school children pick up the academic ranking we give them, and its effect on self-esteem.

695s Podmore, V. and Bird, L.
Taking care of themselves.
*Best of **set**: Junior Classes, 1992; previously published in **set** no.2, 1986, item 9; see entry 405.*
Even at 5 years old children are quite clued up about ways to keep well.

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set number 1, 1993

696 Rowe, Dr Katherine; Fitzgerald, Patricia; Higgins, Rhonda; Anderson Gwenneth; McLaughlin, Mary; Brewin, Tessa
Educational strategies for chronically ill students – with a special section on chronic fatigue syndrome.
***set** no.1, 1993, item 2.*
Practical measures to assist children at home and back into school after a long illness.

697 McPherson, Andrew
Measuring added value in schools.
***set** no.1, 1993, item 3.*
How to show how good schools are at improving their pupils' earlier knowledge.

698 Stevenson, John and McKavanagh, Charlie
Practice 10, theory 5. An examination of the depth of learning.
***set** no.1, 1993, item 4.*
Tertiary level classes are dominated by information-giving by ever-talking teachers. Higher levels of thinking are encouraged and used in practical classes more than in theory classes.

699 Peard, Robert
Gambling, with maths.
***set** no.1, 1993, item 5.*
A project on teaching the mathematics of gambling and its social effects.

700 Bransgrove, Evelyn and Jesson, Athena
A matter of survival: stress and the emergency teacher.
***set** no.1, 1993, item 6.*
The problems relief, supply, mobile, or emergency teachers face and how schools can assist them in their stressful job.

701 Constable, Cheryl
Peer tutoring in computer skills.
***set** no.1, 1993, item 7.*
Two 13-year-olds, expert in a computer programme, taught two 16-year-olds. Good advice for peer-tutoring and computer instruction.

702 Perry, William Jnr.
Examsmanship and the liberal arts.
***set** no.1, 1993, item 8.*
A famous discussion of the issues raised when a student at Harvard received an A for an examination he did, for fun, in a subject he had never studied.

703 Christensen, James
Content and methods.
***set** no.1, 1993, item 9.*
Video-taping and interviews revealed a big gap between what is said to be taught and what is actually taught.

704 Holton, Derek
What mathematicians do.
***set** no.1, 1993, item 10.*
What delights mathematicians and what could delight our pupils.

705 Dwyer, Peter
Hopes and fears of students in Australian schools.
***set** no.1, 1993, item 11.*
Young adults at school are satisfied with their schooling, their homes and friends. But fear of not finding a job is universal and debilitating.

706 Anstey, Michele
Examining classroom talk.
***set** no.1, 1993, item 12.*
The talk of two teachers dealing with the same topic, is described. More variety, suiting the words to the teaching point, and thinking the subject out better, seem to be required.

707 Tauber, Robert
Wielding power in the classroom.
***set** no.1, 1993, item 13.*
There is power that you resent and power you respect. Ways to create power that flows from admiration and regard are explained.

708 Cocklin, Barry
Going back to school as an adult.
***set** no.1, 1993, item 14.*
A case study of adults back at ordinary schools shows how successful it can be.

709 Bradley, Graham and Stock, Jacqualyn
Students-at-risk.
***set** no.1, 1993, item 15.*
A co-educational state high school in Queensland developed a way of identifying and helping children-at-risk.

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set number 2, 1993

710 McDonald, Geraldine
Learning to be intelligent.
***set** no.2, 1993, item 2.*
Several kinds of research led to the study of how junior school children learn school-ways-of-thinking.

711 Berwick-Emms, Patricia
There still will be days.
***set** no.2, 1993, item 3.*
A case-study of a truant and how, with the help of professionals, her trouble with school gradually lessened.

712 Hattie, John
Measuring the effects of schooling.
***set** no.2, 1993, item 4.*
Does the introduction of a new teaching technique help children learn? Would it be better to reduce class size, get a new teacher, send the children home?

713 Gray, Susan
Listening: what our pupils tell us.
***set** no.2, 1993, item 5.*

Susan Gray got students to tell her what made listening and comprehending difficult for them.

714 White, Richard
Questionable assumptions underlying secondary school classrooms.
***set** no.2, 1993, item 6.*
15 assumptions get in the way of good education; for example, teachers must punish but teachers must not punish.

715 Poskitt, Jenny; McAlpine, Don and Ryba, Ken
Achieve is choice.
***set** no.2, 1993, item 7.*
Challenging the assumption that children of equal age must all be taught the same curriculum, and together, a secondary school tried other ways very successfully.

716 Kelly, Marie and Moore, Dennis
'I've found my memory!': reciprocal teaching in a primary school.
***set** no.2, 1993, item 8.*
Getting the children to 'be the teacher' for a while resulted in great gains in reading for the children. Teachers found it easy too.

717 Mosley, David
How lack of confidence in spelling affects children's written expression.
***set** no.2, 1993, item 9.*
Poor spellers restrict their vocabulary and their syntax to avoid words they cannot spell, giving quite a wrong impression of their intelligence.

718 Bevan, Roy
The (relatively) constant consonant.
***set** no.2, 1993, item 10.*
Only the consonants – and not all of them – have any agreed speech value. How this can be turned to advantage by teachers.

719 Freebody, Peter
Literacy, in classrooms, curriculums, assessment and politics.
***set** no.2, 1993, item 11.*
It is a stimulating look at classroom practice, assessment of literacy, and mis-matches of policy and method.

720 Inder, Patricia and Todd, Ro
Conflict and resolution during co-operative learning with computers.
***set** no.2, 1993, item 12.*
Two classroom research projects: co-operative learning was used to encourage cognitive progress, paradoxically, using conflict, and its subsequent resolution.

721 Schofield, Neville
When aptitude and preferences mis-match.
***set** no.2, 1993, item 13.*
Some children learn well in one way, e.g., visually, but prefer the other, e.g., verbally, (at which they are not as skilled.)

722 Rollo, Lindsay
Words and images in print and on screen.
***set** no.2, 1993, item 14.*
The computer has turned us all into typographers – the arrangers of print and graphic material. Research into legibility.

723 Cameron, Marie and Grudnoff, Lexie
What principals think of their beginning teachers.
***set** no.2, 1993, item 15.*
A College of Education looks at how its graduates are appreciated, and what could be done to do a better job.

Best of *set*: Mathematics

724s Livingstone, Ian and Izard, John
Contents and introduction.
*Best of **set**: Mathematics, 1994, item 1.*
The introduction, summarises recent trends in mathematics education in New Zealand and Australia.

GENERAL

725s Begg, Andy
Twenty-nine tough questions.
*Best of **set**: Mathematics, 1994, item 2; not previously published.*
Challenging teachers to think about important topics confronting mathematics educators.

726s Withers, Graeme
Unlocking the great secret.
*Best of **set**: Mathematics, 1994, item 3; previously published in **set** no.2, 1989; see entry 487.*
The techniques of process writing are used to help both children and teachers understand mathematical thinking in problem-solving.

727s Carr, Ken and Ritchie, Garth
Evaluating learning in mathematics.
*Best of **set**: Mathematics, 1994, item 4; previously published in **set** No. 1, 1991; see entry 619.*
Methods of assessment under scrutiny: norm based, mastery based and interview techniques.

728s Masters, Geoffrey and Doig, Brian
Understanding children's mathematics: some assessment tools.
*Best of **set**: Mathematics, 1994, item 5; not previously published in **set**.*
Adapted from *Assessment and Learning of Mathematics*, edited by Gilah Leder. Describes advances in formative assessment using computer-generated graphics to give assistance.

729s Holton, Derek
What mathematicians do.
*Best of **set**: Mathematics, 1994, item 6; previously published in **set** no.1, 1993; see entry 704.*
Insight into what delights mathematicians and may delight our pupils.

PRIMARY

730s Young-Loveridge, Jenny
Number skills in junior classroom.
*Best of **set**: Mathematics, 1994, item 7; previously published in **set** no.2, 1988; see entry 468.*
Teachers are very good at judging children's mathematical knowledge and skills. But some types of syllabus do not bring about maximum progress.

731s English, Lyn
Small children solve big problems.
*Best of **set**: Mathematics, 1994, item 8; previously published in **set** no.2, 1990; see entry 598.*
This evidence of abstract thought and mathematical problem-solving encourages everyone to aim high.

732s Carr, Ken
There are numbers behind the piano.
*Best of **set**: Mathematics, 1994, item 9; previously published in **set** no.2, 1986; see entry 403.*
By asking bizarre questions and listening to children's explanations, Ken Carr found how to clear away misconceptions.

733s Irwin, Kathryn
Being both right and wrong.
*Best of **set**: Mathematics, 1994, item 10; not previously published.*
Some processes in mathematics seem quite illogical to children – help with seeing impasses and overcoming them.

734s Hunting, Robert
Beginning to learn fractions.
*Best of **set**: Mathematics, 1994, item 11; previously published in **set** no.2, 1989; see entry 494.*
Ways of introducing fractions so that the natural instincts of children in sharing and counting are built upon.

735s Thomas, Gill
Helping one another learn.
*Best of **set**: Mathematics, 1994, item 12; previously published in **set** no.2, 1992; see entry 676.*
Examines young children's ability to help one another in mathematics.

SECONDARY

736s Ellerton, Nerida
A Child's perspective of algebra. What is it that makes algebra a mystery to some children?
*Best of **set**: Mathematics, 1994, item 13; previously published in **set** no.2, 1985 (Australian Edition); see entry 373a.*
Children talk through their solutions to 10 mathematics problems. Abstract mathematics should develop from children's own needs and experiences.

737s Rowe, Ken
What are the benefits of single-sex

maths classes?
*Best of **set**: Mathematics, 1994, item 14; previously published in **set** no.1, 1990; see entry 584.*
An experiment at Ballarat High School shows definite benefits in this school. Includes critical comment.

738s Knight, Gordon; Arnold, Greg; Carter, Michael; Kelley, Peter; Thornley, Gillian
Mathematical needs of school leavers.
*Best of **set**: Mathematics, 1994, item 15; also published in **set** no.1, 1994; see entry 743.*
The school maths curriculum does not match the mathematics adults use in everyday work.

739s Anon
How I failed.
*Best of **set**: Mathematics, 1994, item 16; not previously published in **set**.*
Short, witty piece emphasises the danger of over-simplification.

set number 1, 1994

740 Thirlaway, Kathryn and Benton, David
Activity, fitness, mental health and mood.
***set** no.1, 1994, item 2.*
Most adults find it difficult to keep an exercise programme going; but active children become active adults.

741 Groundwater-Smith, Susan and Forster, Kathy
Don't patronise us!
***set** no.1, 1994, item 3.*
The voices of 50 working class mothers commenting on their own schooling and that of their children.

742 Wylie, Cathy
The too hard basket?
***set** no.1, 1994, item 4.*
Listening to parents and teachers and then working on ways to close the gap between their widely differing expectations.

743 Knight, Gordon; Arnold, Greg; Carter, Michael; Kelley, Peter; Thornley, Gillian
Mathematical needs of school leavers.
***set** no.1, 1994, item 5.*
The school maths curriculum does not match the mathematics adults use in everyday life and work.

744 Griffin, Patrick
Literacy on the job.
***set** no.1, 1994, item 6.*
Modern industry needs literate workers. Study of BHP workers shows how literacy can be improved.

745 Winefield, Anthony; Tiggerman, Marika; Winefield, Helen
The young employed and unemployed.
***set** no.1, 1994, item 7.*
A follow-up study of school leavers, looks at the effects of an unsatisfactory job, and of 'doing nothing in particular'.

746 Ray, Carol and Mickelson, Roslyn
Restructuring students for restructured work.
***set** no.1, 1994, item 8.*
As industry has restructured itself attitudes to work have changed. The trends, the reasons, the consequences.

747 Crystal, David (Editor)
The process of reading.
***set** no.1, 1994, item 9.*
A review of current knowledge, physiology, experiments and conflicting theories.

748 Campbell, Jack and Robinson, Margaret
Three dozen's a crowd.
***set** no.1, 1994, item 10; previously published in **set** no.1, 1983; see entry 310.*
In suburbs where classes were increasing, and decreasing, the effect of crowding (on learning, attending, withdrawing, and aggressive behaviour) were discovered.

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Editorial

AS AN EX-TEACHER with research, writing and editing experience I am enjoying this latest challenge of bringing the best educational research information to the attention of those most likely to make a difference in the classrooms of Australia and New Zealand - you, the teachers, educators, principals, members of the boards of trustees and parents, who read ***set***.

The teachers of my own children (two at pre-school, one at primary school, with secondary school not far away) present me with a strong incentive. When they read ***set*** what will they learn? Will they be inspired to try something new in the interest of better education? My own schooling was varied, spanning continents as well as the private and public sector. I feel at home with the eclectic, broad coverage of ***set***.

There's a little bit of something for everyone in this issue: maths, science, arts, reading, health studies, practical ideas for classrooms, hints from "outstanding" teachers of composite classes, minority language revival, assessment techniques and a study of teachers' health problems. I trust you will find inspiration from these articles, written primarily with you, the teacher, in mind.

Of special interest for 1995, New Zealand's Year of Maori Language, are the articles on minority language revival and teaching mathematics and reading in Maori. Lessons learnt here are equally relevant for the growing number of non-English speaking immigrants in Australia and New Zealand.

In the next issue of ***set*** watch for articles presenting the point of view of your students. What are their solutions to discipline and cheating? What is their view of effective teaching? Why do perfectly healthy adolescents diet?

Judith Wright

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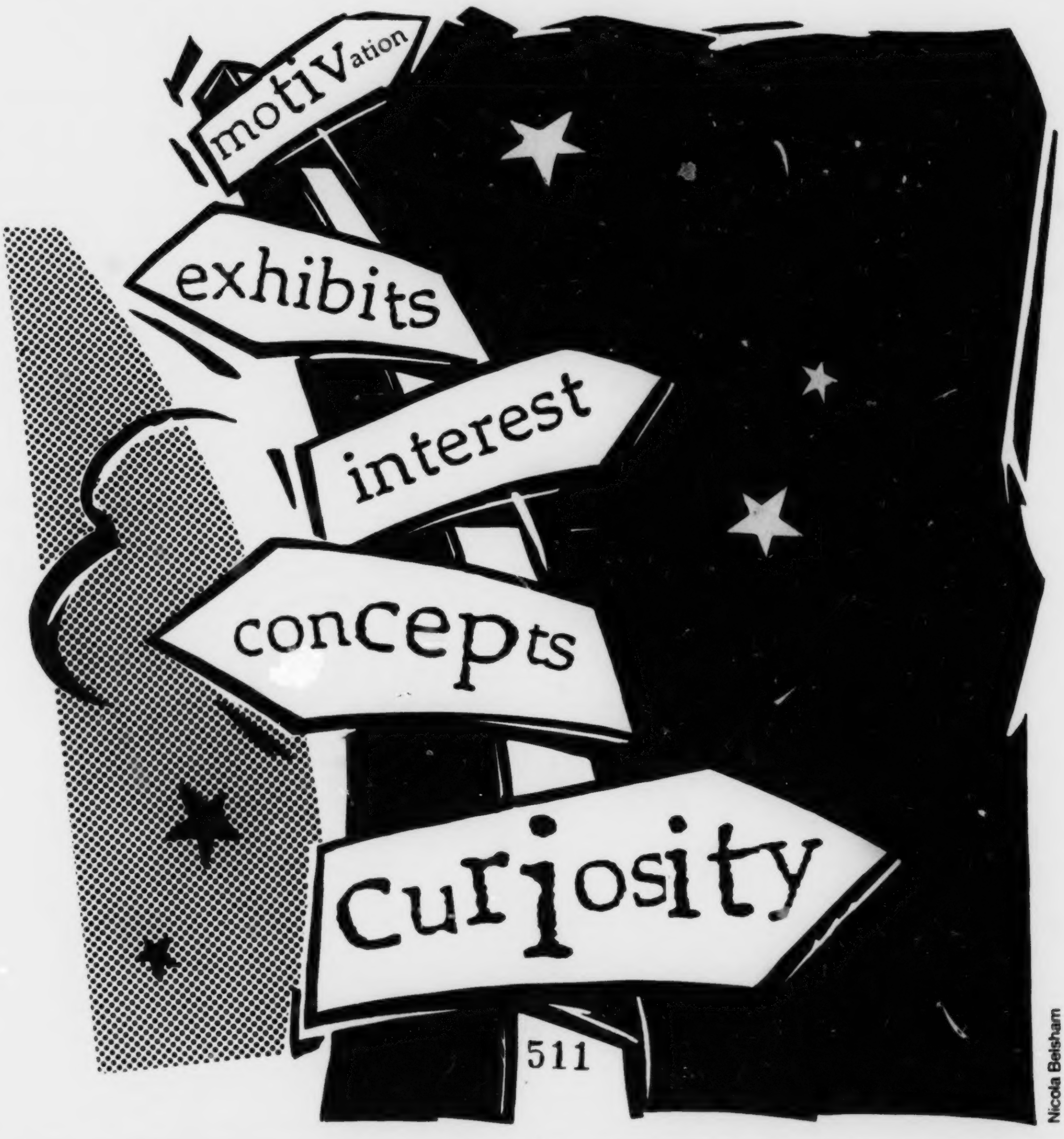
DON'T COMPARE, COMPLEMENT

Making the best use of Science Centres and Museums

Léonie Rennie and Terry McClafferty
Curtin University of Technology


motivation
exhibits
interest
concepts
curiosity

Nicola Belsham

Don't Compare, Complement

Léonie Rennie and Terry McClafferty

SCIENCE CENTRES AND MUSEUMS are a growth industry in Australia and New Zealand. The increase in the number of interactive science and technology centres in Australia and New Zealand has been accompanied by an increase in the number of school visitors, in fact school groups are a major target audience for these centres. They offer exciting exhibits and themes, providing opportunities for children (and adults) to experience science and technology in a non-threatening and stimulating environment. How can teachers use these centres to promote students' engagement in school science, which might seem boring and mundane by comparison? Do such centres affect learning? Do they offer valuable motivational opportunities for students to learn science? Or, is the fun of the visit soon forgotten in the routine of science lessons back at school? Answers to these questions are provided by a review of research findings related to school-aged children's visits to interactive science and technology centres, including museums, zoos, botanical gardens and aquaria where there is opportunity for interaction with exhibits.

Why visit interactive science and technology centres?

Teachers take their class to visit an interactive science and technology centre for many reasons: the desire for a "change of pace", science enrichment, a social experience for the students, as well as to increase their exposure to science. There is good research evidence that school visits to science centres, museums, zoos, art galleries and so on, are memorable events. Teachers can probably remember field trips they attended when they were students, even though their memories of classroom events may be hazy. Of course, students will have their own personal and social agendas for the visit, which may be quite different from the teacher's educational agenda! It is important that teachers take this into account when planning the visit. If the purpose of a visit is essentially related to entertainment, it is likely that the learning outcomes will be quite different from those of visits which are structured to perform a specific role in a sequence of school work. In the following sections, the reasons for these differences in outcomes become clear.

What happens on a visit?

What visitors do at interactive science and technology centres is well documented. They orientate themselves for the first few minutes, attend to the exhibits for some considerable time, about 30 minutes or more, and then "cruise" for a further period, perhaps 15 to 30 minutes. Similar behaviour is observed for children, with a period of "roaring around" followed by "settling down". Some researchers suggest that a visit of two hours is an appropriate length, as shorter visits can lead to a lack of involvement, and longer visits result in lag of interest.

If students are visiting for the first time, exploring the centre and orientating themselves is a high priority, and in a new, unfamiliar setting this behaviour takes precedence over the teacher's plans for the visit. Students familiar with a setting tend to learn more than those who are not, although if students are very familiar, they may find the setting or the exhibits boring. On the other hand, some young children may become anxious in an unfamiliar setting, particularly if the visit is not structured. Students need time to explore the exhibits which interest them, as well as those the teacher has planned for them to see.

Research shows that when the novelty of the setting is reduced, for example by showing a videotape of the venue, the amount of purposeful exploratory behaviour can be increased. Information about how lunch will be organised, where the toilets are, and the price of dinosaurs in the centre shop are issues of great importance to children. Other pre-visit orientation activities, including a variety of lectures about concepts, readings and other guide materials, have been effective in promoting the learning of students and young adults. Not surprisingly, it has been found that both cognitive and affective learning can be increased when teachers use pre-visit activities to structure their class's visit and link it to class work.

Once students begin interacting with the exhibits, they tend to do it in a stop-start manner, revisiting exhibits that interest them, often several times. Students interact in different ways, ranging from careful studying of an exhibit to zooming past with a flick of a lever or a push of a button. It is clear that students' prior knowledge is important in how they interact and what they learn from exhibits. Students, even undergraduate students, also need time to play with and explore the exhibits before they begin to understand them. Exhibits are interacted with most effectively by children whose thought processes match those required to understand the exhibit.

The social nature of the visit is another important factor. Research evidence suggests that interactions between people are at least as important for learning as those between the individual and the exhibit. Peer-teaching is a frequent occurrence, with children taking on the role of explainers as they question their companions, read labels aloud, and demonstrate to each other the way the exhibit works. Some students who are not usually successful in school may be successful peer leaders during visit activities. The optimum size of a group for working at an exhibit is small, so that students are more able to ask questions, receive answers and handle the exhibits. Pairs get most deeply involved in the activities. In larger groups, some members' opportunity to learn is reduced because they have less time to interact with the exhibit themselves.

According to some research, children prefer to be with peer companions rather than adults and many prefer to teach themselves, even when exhibits are not interactive. Generally, children have been observed to behave in a more social way than adults, demonstrating more co-operative and sharing behaviours. Students enjoy the social aspects of their visit, but they may also have solitary experiences, learning by themselves or watching other people interact with exhibits.

Another factor affecting learning is the means by which students are cued to the salient features of the exhibits. The most common type of cue is the labelling of the exhibit. Complex labelling can be off-putting, and most science centres are aware of the optimal style and positioning of labels. Although labels often seem to be ignored, many visitors do read them and often read them to each other.

Young children are less likely to attend to labels and may need encouragement to stay with an exhibit long enough to "get it to work".

Worksheets provide another kind of cue to direct attention to exhibits, but their use is problematic. Good worksheets are directly related to the exhibits, unambiguous, integrated with school work, and they take considerable time to prepare! Some researchers believe that worksheets impede learning because they restrict the focus of children's thought processes and prevent them from thinking of their own questions to ask. In fact, some researchers have helped students to compile their own worksheets for visits to zoos and museums. Other research suggests that for older students, one worksheet per group can be effective, because this promotes opportunities for meaningful, co-operative group learning rather than simply trading answers, as often happens with individual worksheets. Particularly with younger children, the worksheets should focus on the exhibit itself, rather than its labels, to encourage children to develop their powers of observation.

Explainers (and teachers or parents who chaperone school groups) also provide cues by asking questions to help students to attend to significant aspects of the exhibits. The presence of explainers is important. Because students have different combinations of background experiences, interests and skills, they will interact differently with exhibits and thus need different kinds of help. Effective explainers try to open-up students' thinking rather than direct them to the right answer and their effectiveness tends to be greater when the exhibits are not interactive.

The effect of teachers' involvement during their class visits to interactive science and technology centres is significant. Research and the experience of science centre staff indicate that, although they realise the importance of preparing themselves and their class for the visit, many teachers do not plan either preparatory or follow-up activities. Some teachers involve themselves fully with students and others have been observed to abandon their class and occupy themselves in the coffee shop. Yet the participation of teachers in their class visit can be very beneficial, for both students and the teachers themselves. Teachers express surprise at how much, and which, students know about science when they see them interacting in the unstructured environment of the interactive science and technology centre.

What to expect from a visit

There are a range of possible outcomes from visits to interactive science and technology centres, although measuring them is not easy. Many studies have reported gains in cognitive learning and/or more positive attitudes to science as outcomes of visits, but the findings for cognitive and affective change are not always consistent. For example, one researcher found that cognitive learning was enhanced by a structured, docent-led tour of a natural history gallery, but an unguided group reported more favourable attitudes. Other researchers concluded that a well-structured class lesson was more effective in promoting learning than a visit to an exhibit at a science museum, but the visit was perceived to be far more enjoyable and interesting. The students in this study considered themselves to be learning during their visit and some thought they learned more than in the classroom lesson. Children, especially young children, often do not distinguish between learning and enjoyment and there is probably little point in trying to separate them.

Overall, the research findings suggest that clear, demonstrable cognitive gains from visits to interactive science and technology centres are not all that should be considered in deciding whether visits are beneficial. Researchers draw attention to the self-motivated learning that occurs during school field trips, and there is much evidence that students remember their visit long after it has occurred, and these memories are both affective and cognitive. Educationally effective programmes have been defined as "those in which products are not emphasised, inquiry is sparked, open-ended questions are generated, and students actively participate and appear involved". It is not surprising that a list of benefits from visits to interactive science and technology centres, aside from students' learning, include the excitement and pleasure children gain from visits; that non-academic and non-English speaking students can get involved; and that students develop co-operative ways of working.

Summary of research findings

The research reviewed provides answers to two of the questions posed in this paper. Visits to interactive science and technology centres are memorable events. They do affect students' learning and they do provide valuable motivational opportunities for students to learn science. Overall, the research suggests that although students usually find visits enjoyable, both the amount and nature of their cognitive and affective learning are variable. Learning is influenced by the extent to which students are familiar with the setting, their prior knowledge, the match between the cognitive level of students and the thought processes required by the exhibits, the degree of structure of the visit (including pre- and post-visit activities), the provision and nature of the cues for learning, and the social aspects of the visit. Many of these factors are under the direct control of the teacher, thus it follows that teachers can make a difference to the value of their class visits to interactive science and technology centres.

Practical suggestions

The research literature suggests recommendations for those who are organising a visit to an interactive science and technology centre in order to enhance students' learning in science. Remember that both students and teachers will have a say in what happens during a visit, so the most important thing is that they both have similar expectations of the outcomes of the visit.

Before the visit

Teacher preparation. It's a good idea to visit the interactive science and technology centre first to discover what exhibits there are, what concepts or phenomena they demonstrate, what level of thought processes they require to be understood, whether there are worksheets or other cues are available, and how movement around the centre can be organised. This information can help to determine how to make the visit fit the needs of the current teaching programme. Exhibits which demonstrate the concepts being dealt with in the class and which match the cognitive level of the students can be chosen. Learning activities can be built around the exhibits, in terms of pre, post and during visit instruction. Many interactive science and technology centres have inservice courses and/or education officers who can help plan a visit. Take advantage of them.

Student preparation. Informing students where they are going and determining their familiarity with the centre will indicate whether or not novelty is likely to be an important factor in the visit. It can then be decided whether or not to provide orientation information, such as maps showing the layout of the centre, including assembly points, lunch areas, toilets and so on. Remember that students are often more concerned about whether they will be able to visit the museum shop than they are about the teachers' plans for the visit! Having students help to plan the objectives of the visit is an effective form of pre-visit instruction. Knowing what learning objectives are targeted serves as an advance organiser for students and they can be more self-directed in achieving them. Related preparation for students includes providing them with a list of the exhibits to be visited (although they may visit others) and ensuring that they have the necessary background knowledge and skills to use and understand how the exhibits work. The nature and requirements of post-visit activities should also be made clear before the visit.

During the visit

Orientation. Students unfamiliar with the environment of the interactive science and technology centre will require some time to settle down to work. Students will also engage in preliminary playing and exploration with exhibits even when they are seriously working.

Interacting with exhibits. Besides helping students keep track of time and their learning objectives, teachers can provide cues to facilitate learning by being available to respond to questions and make suggestions to extend their thinking and understanding. Students with different levels of skills may need different kinds of help.

Social interaction. To capitalise on students' enjoyment of social interaction and the peer teaching which occurs, students can be encouraged to work in small groups and share the responsibilities associated with learning.

Recording. If students are to use worksheets or some other means of recording their findings, this is usually most effective with one worksheet or record per group.

Concluding the visit. Near the end of the visit, it may be necessary to check how students are progressing in achieving the objectives of the visit, so the remainder of their time can be structured effectively. Teachers should be aware of the students' agendas for the visit. Make sure that students know they will have at least 20 minutes to explore the things that interest them.

After the visit

Common sense suggests that post-visit activities should reflect the varied nature of the experiences students had at the interactive science and technology centre. Young children in particular, should be given the opportunity to share their experiences and findings with their peers through class presentations, group reports or posters. Students can plan further research or experiments based on what they have found out. In subsequent lessons every opportunity should be taken to refer back to exhibits and activities experienced during the visit, thus reinforcing and extending the learning which occurred.

Discussion

The major question addressed in this paper was "how can teachers use interactive science and technology centres to promote students' engagement in school science, which might seem boring and mundane by comparison?" We think that, in three words, the answer is Don't Compare, Complement. Students find interactive science and technology centres exciting and different from school, and the visits more interesting and enjoyable than effective class lessons, even when given in the museum. It is not realistic to expect every lesson to be as exciting as a visit to an interactive science and technology centre, nor would that necessarily be an effective way to achieve the objectives of the science curriculum. Instead, we believe it is best to integrate visits to centres into the teaching programme to complement the learning activities at school.

In making visits integral to their programme, we suggest that the teachers' most important decisions relate to why they take their class to the interactive science and technology centre. The reasons for the visits determine how teachers should prepare themselves and their students to maximise the complementary effect. For example, if the purpose of a visit is to provide motivation, then the focus of the visit will be on affective outcomes, the arousal of interest and curiosity about concepts that the students are finding rather mundane at school. The exhibits chosen will be those that relate to school work, but provide new (and perhaps extra-curricular) perspectives on those concepts. If the focus of a visit is to provide an introduction to a topic, then the visit will need to be centred around a range of exhibits chosen because they demonstrate a variety of concepts to be covered in the topic, so that students will leave the centre with a range of unanswered questions they will be able to pursue back at school. And if a visit is to revise and consolidate the learning of concepts, exhibits should be chosen which provide new demonstrations of related phenomena and applications of associated properties. Through careful preparation, the enjoyment and enthusiasm aroused by the students' visit can be transferred to the achievement of science objectives back at school.

Notes

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This research first appeared as
  Rennie, L., McClafferty, T., & Johnston, D. (1993, November). *Interactive science and technology centres : helping teachers make the best use of them.* Paper presented at the Annual Conference of the Australian Association for Research in Education, Fremantle, Western Australia.

A good overview of the science centre or museum visit experience and the factors which interact to determine its outcomes is presented in
  Falk, J.H., & Dierking, L.D. (1993). *The Museum Experience.* Washington, DC: Whalesback Books.

The definition of educationally effective programmes is found in
  Price, S. & Hein, G.E. (1991). More than a field trip: Science programmes for elementary school groups at museums. *International Journal of Science Education*, 13, 505-519.

Much more about research on visitors to science centres and museums is available in
  Lucas, A.M. (Ed.). (1991). Informal Sources for Learning Science [special issue]. *The International Journal of Science Education*, 13, no 5.

A general discussion of the potential for learning from museum visits is in
  Falk, J.H., Koran, J.J. Jr. & Dierking, L.D. (1986). The things of science: Assessing the learning potential of science museums. *Science Education*, 70, 503-508.

A good review of research relating to family visits in given by
  Dierking, L.D., & Falk, J.H. (1994). Family behaviour and learning in informal settings. *Science Education*, 71, 643-656.

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item 2

Breaking Down The Barriers

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A Health Initiative Involving School and Community

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HEALTH EDUCATION is not like history or maths. An historical fact taught at school does not depend for its effectiveness on being passed on to individuals outside the school. Health education, and particularly that part which deals with the control of sexually transmitted diseases, is very dependent on the transmission of this information to others in the pupils' social world. It is the right of parents to know what is being taught and the information, in order to be effective, must be accepted by the peer group. It is information which may be challenged and resisted by some groups outside the school. For example, there are different degrees of acceptance of sexual orientation and of some methods of contraception. People also vary in whether they believe that the control of HIV / AIDS, STDs and teenage pregnancy can be found in "safer sex" or in "no sex". Is it realistic to promote "no sex" to adolescents? Does "safer sex" open the floodgates to promiscuity? These questions strike at the very heart of social and parental fears and concerns.

This paper uses evaluations of a project of teacher development for HIV / AIDS-sexuality education to show the complexities involved with transferring knowledge and information.

The project

In 1992 the Department (now Ministry) of Health contracted the New Zealand Combined Colleges of Education to carry out a project of teacher development for HIV / AIDS-sexuality education within the health curriculum of New Zealand secondary schools. Schools involved were asked to document the project as it proceeded. In 1993 the Public Health Commission took over the funding from the Ministry of Health and the Ministry of Health commissioned an independent evaluation of the outcomes for the first two pilot clusters of schools (five in Wellington and six in Auckland). Subsequently, the National Director of the project commissioned an evaluation of the progress of the project in a group of schools in rural areas and with substantial Maori school populations. The following account draws on the two evaluation reports covering 17 schools and the documentation collected as part of the project. There are now 12 clusters of schools, seventy-two schools in all, spread across New Zealand.

In every area where the training was to be held, schools were advised of the project and invited to participate. Each school had to supply a team of four – three teachers and a parent – to attend the workshops. The board of trustees were asked to sign a contract agreeing to implement a classroom programme focused on HIV / AIDS education at at least one form level in their school.

The content of the training was very broad and covered HIV / AIDS and sexually transmitted diseases (STDs), skills for transmitting the information, practise in delivering the material and explanation of the holistic philosophy behind the programme. Visiting speakers were a feature of the workshops. They included representatives of community agencies, and Maori individuals and groups working to prevent HIV / AIDS. A facilitator was available to support and guide the teachers as they put the project into practice in their schools.

Everyone who attended the workshops received a package of resource materials. Unlike most health programmes this resource was not a set of lessons to be followed. The package contained a wide range of materials: facts about HIV / AIDS and STDs, information about wider social and personal issues connected with sexual behaviour and descriptions of a range of classroom activities. Participatory and interactive techniques for delivering the material was modelled during the workshops. There were many favourable comments from teachers about the fact that they could choose particular materials to suit the ethos or the special character of their own school. The principal of an integrated school commented that this was a key factor in the school's decision to participate. This school presented the material within the context of religious education.

Following the first teacher development workshop the team from each school was required to report what they had learned and to explain the project to the board of trustees, to the staff and to the parents. They were also required to assist with the development of a school policy on HIV / AIDS.

The project aimed to enable teachers to provide students with accurate and unbiased information about HIV / AIDS. As a consequence of the project health topics acquired greater status as well as increased coverage within the pilot schools. However, the project was wider in scope than this might suggest. First, it involved a range of people including parents from within the school community. Second, during the workshops the participants heard from representatives of community agencies from outside the school. Sexual health services, public health nurses, the NZ AIDS Foundation, the Family Planning Education Unit, Te Roopu Te Tautoko Trust, and National People Living with AIDS were only some of the agencies represented. Third, it was a project which went beyond the school gate to the parents and, in many instances, to the general community.

The pilot schools

The schools in the first two pilot clusters and in the second evaluation were all state co-educational schools with the exception of two. One of the latter was an integrated school for girls and the other was a state school for girls. The schools which opted into the project in the first two pilot clusters contained a disproportionate number of women principals of co-educational schools. All the parent representatives were mothers. It is interesting to note the difficulty in encouraging single sex schools for boys to participate in the project. The gender bias is not the consequence of any one single factor. However, it does indicate that women exhibit a greater acceptance of education about sexual orientation and a greater concern for appropriate sexual behaviour.

The methods of collecting information

The groups of participants in each school filled in forms designed to track the progress of the project, the extension of the health curriculum and the particular methods and techniques used in each school. The external evaluations collected information by face-to-face interview. The first was based on interviews with principals and teachers, parents and representatives of community agencies who had attended the first workshop. The second sought the opinions of these same parties but was extended to include some students, some members of boards of trustees, other staff and Maori participants.

Technology transfer

The traditional method of evaluating educational projects is to find out what students know as a result of a particular intervention. In the evaluation of a complex project such as this a summative evaluation would not have captured all that was going on. An additional kind of analysis was clearly needed.

In the field of the physical sciences knowledge which has relevance for industry must be transferred to those industries before it can be used. Therefore it is of great importance to understand and to trace the process by which this knowledge is transferred. Health also consists of a body of knowledge. The HIV/AIDS-sexuality education project, however, is in many ways more complicated than a simple transfer of new knowledge to an application in an industrial setting. HIV/AIDS-sexuality education involves challenging common beliefs, changing attitudes and values and using appropriate teaching skills to achieve this. While the HIV/AIDS sexuality education project transferred some shared beliefs at every transfer point it also involved different approaches to achieving transfer to different groups. During the evaluation interviews Maori participants often pointed out that success with Maori youth would depend on the appropriateness of the material and the way in which it was presented. As a consequence of the project a bilingual resource is being prepared.

Technology transfer was interpreted in the following way. The first workshop began a process in which knowledge and skills, non-judgemental attitudes and understanding about HIV/AIDS could be passed on to school communities, to students in classrooms and even to broader community settings. Hence it is useful to view the teacher training as providing a technology for which a workshop was designed and to ask to what extent this technology was instrumental in transferring what was learned in the workshops to wider settings. The technology, or rather, cluster of technologies, included interactive and participatory teaching techniques. It included instilling confidence in teachers so that they could discuss HIV/AIDS, sexual behaviour and sexual orientation with colleagues and pupils. It presented ideas which challenged people's belief systems. It involved team building and the provision of continuing support by facilitators for the project teams in each school. One of the clearest examples of the process of transfer was that more levels of schooling were exposed to accurate information.

Two case studies will illustrate the process of technology transfer.

School 1

This is a co-educational school with just under a thousand students on the roll. The school has traditionally been more working than middle class and in recent years has become increasingly multi-ethnic. It includes a large Maori representation and a combined representation of Pacific Islands, Chinese, and Indian pupils that reaches 33 percent. The principal is a woman. The school is attracting the upwardly mobile working class.

According to the principal, the teachers are held in high regard in the community and the school has authority. The school has an open attitude to matters of health and it has not been faced by objections from community groups. The principal believes that in the area in which the school is situated, young people are at high risk of sexually transmitted diseases and pregnancy. At first hesitant about the school joining the project, she knew that her health co-ordinator and other teachers of health were enthusiastic and capable. The project was so well received, and engendered so much enthusiasm, that she appreciated the professionalism of the HIV/AIDS-sexuality education approach and was proud of the school's achievements.

Sexuality had previously been introduced into the fourth form (year 9) and HIV/AIDS and STDs had been included in a programme for the sixth form (year 11) in the previous year. The material gained in the project workshops could be slotted into the existing framework. Those who had attended the workshop gave a series of presentations to the staff and board of trustees. HIV/AIDS was defined as a health issue, not a moral one. Nobody spoke out against the project or its approach. There was one male member in the team. In his interview he said that he had been a little apprehensive about approaching the board of trustees. However, the presentation went well and as the parent representative said, "If the parents hadn't liked it they would have jumped up and down".

A special letter went home to parents informing them of the project. Parents were told of their right to withdraw their child but there were no withdrawals. The school programme stressed safer sex and promoted the message that no one has to consent to sexual activity if they do not want to.

During a transition module for sixth formers, 13 teachers and the parent representative from the board of trustees demonstrated to groups of students the correct use of condoms using the ends of broom handles. Opportunities for follow-up discussions were made available to all students.

The project had transferred very well to the general staff of the school and had been put into practice in classrooms. The parent representative suspected that the community attitude was very "closeted". No school policy on HIV/AIDS had yet been developed.

School 2

This is an all-girls school with an enrolment of 900, half of whom are Maori. A wide range of the socio-economic spectrum is represented in the school. The principal considered that on the whole the community was conservative in its attitudes. Following the first workshop the teachers who had attended held a successful presentation to staff. This involved reports from the teachers concerned and from a man who was HIV positive and who had been a guest speaker at the first workshop. The board of trustees was also informed as was the parents association. A meeting for parents had been convened on the school marae. One of the Maori parents who had attended the workshop had reported to her colleagues at work. A Maori member of staff had been instrumental in bringing another school into the project. She also approached other teachers in the area to set up a group to work on a bilingual resource for HIV/AIDS-sexuality education. A classroom unit on HIV/AIDS and STDs had been delivered to senior girls. Four months later the girls remembered the lesson, understood the message and reported that they had enjoyed the interactive methods of teaching used.

In this school knowledge flowed out in two directions: through wide Maori networks and through narrower

Pakeha (European) networks. The Maori networks included other schools and workplaces, the Pakeha network was related to the formal structures of the school.

A transfer continuum

The workshop participants were all enthusiastic about what they had learned. It had "blown their minds". It had dispelled myths and confronted prejudices. It was all high energy. There were, however, 2 participants out of the 33 interviewed, a teacher and a parent, both of whom had the same regard for the course, but who, in the interview, expressed some reservations. The parent accepted much of it but did not subscribe to what was referred to as the "basic philosophy". The other also accepted much of it but objected to some posters given to workshop participants by a community agency with, this informant believed, the suggestion that they might be suitable for a school notice board. The objection was based on the grounds that the posters treated homosexuality as natural and homosexual behaviour as acceptable. The teacher said that there had been too much emphasis on homosexuality.

Following the first workshop the project went into the schools. Two principals felt that the project had gone a little too fast for their community but all the others were happy with it and expressed pride in the teachers who had given presentations to staff and parents. Before the training teachers had been far less confident about dealing with other staff than with the pupils in the classroom. One teacher who thought he would never have been able to run a session for staff before the workshops, actually performed very well. The reception and acceptance by staff was more varied than that of principals who had, after all, agreed to their school becoming a pilot for the project. General staff reaction ranged from genuine enthusiasm (giving those who had presented the material the feeling that they had raised the status of health education in the eyes of their colleagues) to simple acceptance, "no-one spoke up", to objections in the meeting and a refusal to take part in participatory activities, to a delegation to a principal after the meeting. In every instance the objections came from a small minority. The staff presentations went particularly smoothly in the rural and small town schools.

The staff meetings were sometimes stressful for the presenters. Homosexual members of staff might be apprehensive, and everyone anxious about the way sensitive issues would be handled. The one thing that particularly eased this difficult situation was the humour and the skill used in transferring activities which had been acquired through practise in the workshops.

The facilitators were on call to help the staff. They helped plan programmes and workshops for staff and parents. Since there had been no objection from parents about the programme, there had been no call on the facilitator for this kind of help.

A key factor in the process of transfer was the sharing by schools of their successes and difficulties. For example, the Wellington cluster heard what had been done at a parent meeting in one school and others tried the same activities. A draft HIV/AIDS policy circulated around the schools. In Auckland the health co-ordinators reported telephoning others who had been on the course to seek advice and assistance. The importance of networking has been supported by other research on teacher development. The similarity across all participants in their answers to interview questions on the workshops suggests that there was a high degree of consistency in the delivery of the teacher development programme.

Presentations were given by the parent representative or the health co-ordinator and other health staff, or by all of them, to boards of trustees. Boards of trustees have power and authority over the curriculum and a mission to represent what they believe to be the views of parents. For the most part the meetings where HIV/AIDS-sexuality education was discussed went very smoothly. As one principal commented, "We were developing a policy for health anyway and HIV/AIDS fitted into this context". In the communities described by their principals as containing some very conservative groups, there was usually a negative reaction. One parent reported:

> Initially progress was slow. There were reservations at board level. I became exasperated and blew my top. It was all straightened out after that.

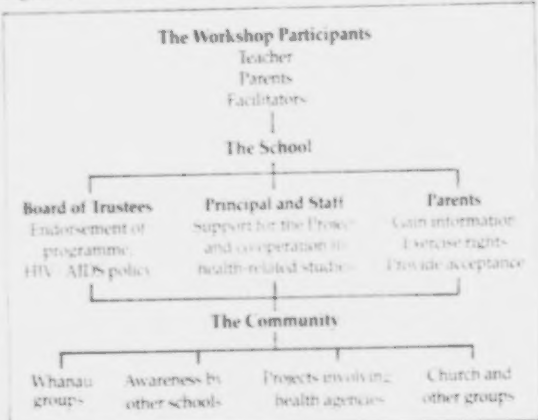
Open invitations to all parents to come to the school to discuss the health curriculum resulted, on the whole, in a low response rate. Unlike meetings of boards of trustees where people know each other, parent meetings can bring together people who may not know each other, people with varying levels of knowledge of what the school is already doing, and with a range of values largely unknown to the presenters. At the time when the second evaluation was completed, schools were making continued efforts to attract parents to meetings.

These accounts reveal the conditions under which the technologies learned in the workshops enabled acceptance and understanding of the goals of the project. Every school contributed something unique to the project. Together they showed the general conditions for successful transfer and the configuration of context factors which may present barriers to transfer.

The transfer which resulted from what had been presented in the workshops went along a continuum as illustrated in Figure 1.

As the project moved through the levels of workshop participants, school, and community, the beliefs, attitudes, and understandings transferred less completely. However, the initiatives taken by schools had in many instances carried the messages a considerable distance. It was neither a goal of, nor a requirement for, the project to change community attitudes in any way other than through the school's capacity to influence those whom it teaches. Nevertheless, there was widespread recognition amongst all those interviewed of the need for community acceptance of HIV/AIDS-sexuality education and, particularly of the need in some schools, to encourage this acceptance. People interviewed spoke of a positive flow and movement of ideas out from the workshops.

Figure 1: *Transfer Continuum*


The Workshop Participants
Teacher
Parents
Facilitators
The School
Board of Trustees
Endorsement of programme, HIV/AIDS policy
Principal and Staff
Support for the Project and cooperation in health-related studies
Parents
Gain information
Exercise rights
Provide acceptance
The Community
Whanau groups
Awareness by other schools
Projects involving health agencies
Church and other groups

The importance of parents

An innovative part of the project was the inclusion of a parent in the team to be trained. It was generally the parents who moved the project out into the wider community. It was they who

- ☐ gave credibility in reports back to their board of trustees
- ☐ reported to parent groups
- ☐ were involved in policy development
- ☐ gave advice to teachers on how to take the parent group with them
- ☐ exerted pressure for a greater focus to be given to health education
- ☐ supported health co-ordinators
- ☐ came to value the teachers and their work.

Some of the parents helped substantially with the transfer process. There were instances of parents persuading the board of trustees to accept the school's involvement. In one or two schools there was some organised opposition mainly on the grounds that the project did not take a judgemental attitude to homosexuality. Parents in the team mediated with other parents to reach acceptance or compromise.

Choosing the parents

Most of the parents were on the school board of trustees or held office in the Parent Teacher Association (PTA), or, as one reported, "I was one of those parents who always goes along to health meetings." Principals reported that they looked for people who had the school's interests at heart.

Workshop parents commented on the general attitudes of other parents in the school. The vast majority, they felt, accepted what the school does. Where acceptance was less than total this was attributed to ignorance or discomfort in discussing sexuality. For some their objections were on religious grounds.

What the parents said

A selection of quotations gives the flavour of reactions from the parents.

> I thought I knew but I didn't. You didn't feel afraid of the dumb question. They were willing to repeat and to clarify. We were never put down.
>
> It has given me an insight into the amount of work and expertise the teachers need to put in a health studies programme.
>
> It has given me confidence as a parent with two teenagers and as a parent involved with informing the community.
>
> I didn't think I was homophobic but I had to face up to this. "Homophobia" was not mentioned. We were thinking of white homosexuals and then along came a Maori representative.
>
> I was not confident [at first] but after the three-day workshop, the written material and the role play I felt confident in reporting back to the PTA.

Aspects of the programme praised most often were being accepted by the teachers, gaining accurate knowledge, getting to understand the techniques of the classroom, the opportunity to be able to "put a human face to AIDS", and to be able to rid oneself of misconceptions and prejudice.

> At the end [of the workshop] we were like a team or a family. I was exhausted and wrung out – a wonderful feeling.
>
> I felt privileged as a parent. There was no "them" and "us".

The most immediately useful aspect of the resources was seen as "the facts and figures" and the "medical information". The attitudinal material was "much trickier to deal with" requiring greater confidence and skill, and emphasising the need for comprehensive training and ongoing support.

The presentations in the workshops by men who were HIV positive made a big impact.

Conclusion

The fact that some schools had moved a considerable distance through the technology transfer continuum shows what the project has been able to achieve. The idea of a continuum can be used by schools to judge their own progress in the process of transfer on the topic of HIV/AIDS and STDs. The concept of technology transfer also provides a framework for schools to evaluate what it is that has been transferred in each instance; facts, attitudes, beliefs, skills, in what combination, and to whom. It also shows where assistance might be sought; in support for principals, in recruiting schools of a different character from those already in the project, and most importantly in engaging the assistance and collaboration of communities including Maori and Pacific Islands communities whose young people were well represented in the schools.

Notes

Dr Geraldine McDonald is Lecturer in Teacher Education, Victoria University of Wellington.

Gillian Tasker is National Director, HIV/AIDS-Sexuality Education Project and is on the staff of Christchurch College of Education.

Gillian Tasker was facilitator for the Wellington cluster, Frances Keogh was facilitator for the Auckland cluster and Anne Woodroofe was facilitator for the rural cluster.

The design of the teacher development project is based on the philosophy of the Ottawa Charter. The contract proposal is set out in *Proposal for the Delivery of Teacher Development for HIV/AIDS Education to be Funded by the Department of Health, Te Tari Ora.* Wellington College of Education, Te Whanau o Ako Pai te Upoko o Te Ika, presented on behalf of the NZ Combined Colleges of Education, 20 May 1992.

The evaluation of the first 2 pilot clusters of schools is documented in

McDonald, G. (1994). *Evaluation of the Delivery of Teacher Development for HIV/AIDS Sexuality Education. Report to the Ministry of Health.* Wellington. NZCER. All enquiries about this publication to: Public Health Regulatory Services, Ministry of Health, PO Box 5013, Wellington, New Zealand.

The evaluation of the project in rural areas is documented in

McDonald, G. (1994, July). *NZ Combined Colleges of Education HIV/AIDS-Sexuality Education Teacher Development Programme Evaluation Two. Report to the National Director.* Enquiries about this report should be made to the National Director, HIV/AIDS-Sexuality Education Teacher Development Programme, C/- Christchurch College of Education, PO Box 31065, Ilam, Christchurch.

The number of women who are principals in co-educational schools can be found in

Helen Slyfield, *The Position of Women in the Education Service 1991 and 1992.* Demographic and Statistical Analyses Unit, New Zealand Ministry of Education, 1993.

Further details on how each school implemented the project can be found in

Tasker, G. (1993). *The Effectiveness of a Teacher Development Programme in Empowering Secondary School Teachers to Develop and Implement Quality Health/HIV Education in their schools.* Report provided to the Public Health Commission, 1993. Available on request from Gillian Tasker, Christchurch College of Education, PO Box 31065, Ilam, Christchurch.

Schools may also contact Gillian Tasker if they wish to be involved in the project.

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Beyond Expectations:

USING CALCULATORS WITH YOUNG CHILDREN

Susie Groves and Jill Cheeseman
Deakin University

The *National Statement on Mathematics for Australian Schools* recommends that all students use calculators at all year levels from kindergarten to year 12, (5 to 18 year olds) and that calculators be used both as instructional aids and computational tools. However, research has shown that, despite overwhelming support for the early introduction of calculators, a majority of infant teachers rarely or never use calculators in their classrooms.

The New Zealand curriculum document, *Mathematics in the New Zealand Curriculum* also encourages the use of calculators in the classrooms from J1 to form 7 (5 to 18 year olds). This is new for J1 to standard 3 students (5 to 10 year olds) and their teachers, as the previous syllabus had no particular requirements for using calculators.

The *Calculators in Primary Mathematics* project

The *Calculators in Primary Mathematics* project was based on the premise that calculators are not just computational tools but are highly versatile teaching aids which have the potential to radically transform mathematics learning and teaching.

In 1990 all children at kindergarten and grade 1 levels in six schools in Melbourne were given their own calculator to use in class. The project moved up through the schools to grade 4 level in 1993, with new children joining the project as they started school. In total about 80 teachers and 1000 children participated in the project. An extensive programme of data collection and analysis – including classroom observation, teacher interviews, written tests and interviews with children – was used in order to attempt to answer the research questions.

Teachers were not provided with classroom activities or a programme to follow. They were regarded as part of the research team investigating the ways in which calculators could be used in their mathematics classes. Feedback and support was provided through regular classroom visits by members of the project team and through the sharing of activities and discussion of issues at network meetings and in the project newsletter.

The project demonstrated that calculators have an important role to play in the infant classroom. The calculator can be used in many imaginative ways within the "normal" range of classroom activities, as well as to provide a mathematically rich environment of its own for children to explore.

The presence of the calculator allowed children to display a knowledge of mathematics which often surprised their teachers – especially in the areas of large numbers, negative numbers and decimals. However, the wide range of skills and understandings present in any classroom appeared to be highlighted by the presence of the calculator.

The findings of the *Calculators in Primary Mathematics* project have significant implications for the learning and teaching of primary mathematics.

How young children use calculators

In order to use calculators with young children, teachers need to realise that calculators can be used for purposes other than "number crunching". Research carried out by the project showed that while teachers express a high level of support for "creative" uses of calculators, this is not matched by their teaching practice. Therefore, a first step towards realising the full potential of the calculator in infant classrooms is to demonstrate ways in which it can be used for purposes other than mere computation.

Classroom observation in the *Calculators in Primary Mathematics* project revealed four major ways of using the calculator. They illustrate the tremendous potential of calculators as a teaching aid and have lead to far-reaching changes in the way in which mathematics is approached in many classrooms.

Using the calculator as a recording device

Young children spontaneously used their calculators as a "scratch pad" to record their telephone numbers, their scores when playing games, interesting patterns and even the date. Writing numerals can be a time-consuming and onerous task for young children, so calculators provide the opportunity to record (often very large) numbers easily and change them at will.

Teachers exploited this spontaneous use by devising many activities which only used the calculator as a recording device. An example of such an activity was *number line up*. A small group of grade 1 and 2 children entered a number of their choice into their calculators and then ordered themselves according to their calculator displays. More and more children were added to the "line-up", with each new child needing to find their correct position. Children frequently included negative or very large numbers in this activity and exhibited a quite sophisticated knowledge of the number system.

Using the calculator to count

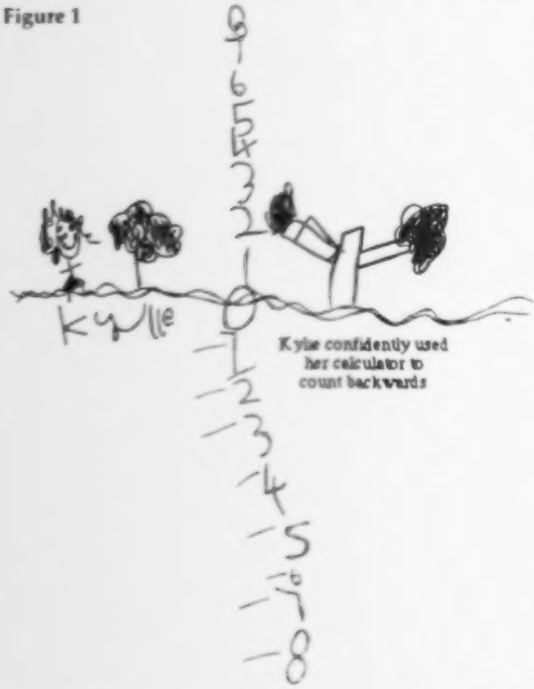
One of the most effective uses of the calculator with young children is as a counting device. The built-in constant function on the calculator allows children to count by any number, from any starting point they choose. By watching the display, children can match the numerals to the words for small numbers; see what number comes before or after any given number; learn about place value; and make discoveries such as how to count by odd numbers on their calculator, or how to count backwards.

One kindergarten teacher initiated an activity – she called it *number rolls* – which became popular with many project teachers. Long strips of paper were used to vertically record counting on by a constant. Many children began by counting by 1's and continued to do so. Others, however, moved on to counting by numbers such as 5, 10 or 100. At least one child observed that counting by 9's usually leads to the units digit decreasing by one each time, while the tens digit increases by one. This activity continued for a long period of time. In the classroom where it started, just as the teacher was ready to abandon the activity, she noticed that many children were beginning to make conscious predictions about the next number in their sequence – even when they could not necessarily read the numbers aloud.

Many children used their calculators to count into the thousands and tens of thousands, while others counted backwards. During a classroom visit Daniel, a kindergarten child supposedly engaged in a quite different activity, wanted to show how he could count by 50's to 4000 on his calculator. Before he could be stopped, he had reached 64 250, which he was able to read aloud without hesitation. In another kindergarten grade, Ben had counted up to 17 900 by 100's on his number roll. When asked what number would be reached after pressing equals two more times, he wrote 18 100, although he read it as eighteen hundred and one.

In another kindergarten class, where children had been discussing and drawing "What lives underground?", Alistair said "minus means you are going underground". When questioned what would be the first number above the ground, he said "zero". In another kindergarten class, Kylie confidently used her calculator to count backwards and recorded her findings (see Figure 1).

Figure 1



Kylie confidently used her calculator to count backwards

A grade 2 child, Sebastian, after playing a game of stepping stones on the classroom floor went away to make a set of his own stepping stone numbers. His teacher had used whole number steps, with numbers in the range 0 to 25. Sebastian also began his steps at 0. He chose, however, steps of tenths, reading them as "point 1, point 2 ", etc. He managed the step after 0.9 in this way: He said "point 9, point 10, no that's 1". Having made the bridge, he then continued easily. A problem arose when Sebastian began to use his stepping stones in an actual game because the operations he chose took him below zero. He stopped for a moment to consider what would happen if the numbers "hadn't been points". Soon he had produced stepping stones for counting backwards into the negative decimal numbers.

Using the calculator as a computational tool

Calculators were frequently used as computational tools, but rarely just to find answers for their own sake. Rather, calculators were used to solve real-life problems (where the size of the numbers would otherwise have been prohibitive) or to carry out numerical investigations.

An example of how calculators allowed children to work with larger numbers and solve more realistic problems was the *tree survey* carried out by grade 1 and 2 children, who worked in groups to tally the number of small, medium and large trees in the large, heavily treed school ground. Children used several different methods to count the trees, including tallying with paper and pencil and counting with their calculators. The calculator allowed the total number of trees (over 150) to be found. Groups obtained different answers, which lead to a lengthy class discussion about which numbers to use when representing the results in graphical form. Children made considerable progress towards developing an understanding of quite sophisticated statistical concepts. The following year the same teacher repeated the tree survey with her grade 2 class. On this occasion, children were confronted with decimals while discussing how to make a pictograph of their results. A group of 7 children needed to make 64 trees to paste onto the chart. When asked by the teacher how many trees each child in the group would need to make, children spontaneously used their calculators to find that 64 ÷ 7 = 9.1428571. The teacher recorded the answer and asked what it meant. A child quickly replied: "It is 9 and a bit, so if we made 10 each we would have some left over – actually we would have 6 left over".

In another activity, kindergarten children sorted the *teddy bears* they had brought to school according to colour and counted how many teddy bears there were altogether – some counted aloud by 1's, some by 2's, others used the constant function on their calculators, while a few used the calculator to find 7 + 4 + 3 + 4 = 18. When they went back to their tables to record what they had done, some children drew bears, others wrote number sentences (see Figure 2), while many struggled to accurately record what they had done. Byron (see Figure 3) immediately wrote the number sentence shown above and then proceeded to find as many ways as he could to get 18 on his calculator as the sum of other numbers – e.g. 9 + 1 + 8 and, even more remarkably, 6 + 6 + 6. Although the calculator was performing the actual additions for him, he needed to predict which numbers would lead to a sum of 18 and only used the calculator to confirm or contradict his predictions.

Using the calculator for exploration

There were teachers at all grade levels who encouraged free play with calculators as part of the normal mathematics programme. Some teachers offered calculator free play as an alternative to silent reading at times when children had a free choice of activity. Many other teachers built an extensive sharing time into their free exploration sessions. This frequently lead to new activities for other children to discuss or try, as well as opportunities for class discussion about what was done with the calculator.

The calculator was also being used as an object of discovery in its own right. Children at all levels were keen to discover the functions of the various keys and to establish for themselves that the + key, for example, has the effect of determining "how many altogether". Individual children

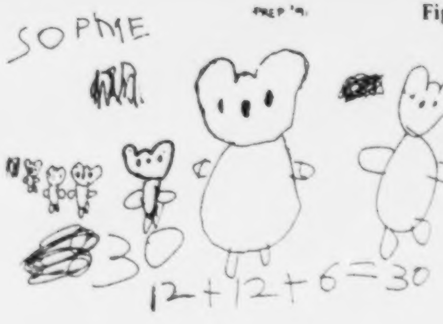


Figure 2

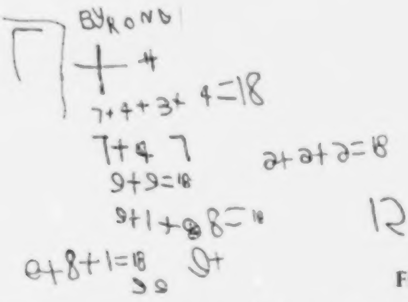


Figure 3

who discovered how to use certain functions, such as the memory, quickly passed the information on to others who were interested – which was by no means everyone. Children were fascinated to find out how to switch off their solar-powered calculators – many kindergarten children tried to see what happened to the display when they put the calculator under their sweaters. A grade 2 and 3 class accidentally discovered that the calculator switches itself off when not in use. They turned this into a maths/science experiment to find out how long this takes. Children devised methods for accurate timing, discussed how many trials would be needed for a sufficient degree of accuracy, and found ways to calculate a rough average of the different trials.

The effect of calculators on children's learning of number concepts

The purpose of introducing calculators was not to make children dependent on calculators, but rather to enhance that elusive quality "number sense", by providing children with a rich mathematical environment to explore. Calculators were used alongside concrete materials and other computational tools, with children often needing to choose the most appropriate tool for the task at hand.

Classroom observations, of the type described above, revealed that many young children were dealing with much larger numbers than would normally be expected, as well as, in many cases, negative numbers and, to a lesser extent, decimals.

In order to investigate the long-term effect of calculator use on children's learning of number, an extensive programme of testing and interviews was conducted at the grade 3 and 4 levels, using the last cohort of children at each year level who had not taken part in the project as the control group.

Despite fears expressed by some parents, there was no evidence that children became reliant on calculators at the expense of their ability to use other forms of computation. The interviews showed that children with long-term experience of calculators performed better overall on a both sets of computation items than children without such experience – in one set they could use any tool of their choice, while the other required mental computation only. These children also performed better on a wide range of items involving place value for large numbers, negative numbers and, more particularly, decimals. They also made more appropriate choices of calculating device and were better able to interpret their answers when using a calculator, particularly where decimal answers were involved. No detrimental effects were observed in either the interviews or the written tests.

Changing expectations and curriculum issues

The presence of calculators and an awareness of the ways in which children use them in their classrooms have stimulated teachers to re-assess their expectations of children.

Interviews and an extensive written questionnaire were used to collect data on teachers' expectations. Preliminary analysis of the questionnaire data confirms that children have, in general, performed beyond their teachers' previous expectations on tasks related to large numbers, negative numbers and decimals.

For many teachers one of the frightening aspects of calculator use is the possibility that children may encounter very large numbers, negative numbers and decimals "before they are ready". Project teachers who had become comfortable with calculators in their classroom took the opposite view. They saw their previous curriculum constraints as imposing artificial boundaries on the children. One teacher commented:

> My expectations have changed enormously. It has changed and challenged both the children and myself. There now seems to be no limits to what we can do in our theme work. I am surprised by the children's understanding of concepts – particularly place value, numbers and decimals (including money).

These changing expectations must, in the long-term, be reflected in changes in the mathematics curriculum. Teachers are being lead by the children into exploring content beyond their previous expectations. The changes which are occurring are gradual and will take some time before they are formally incorporated into school curriculum statements.

The effect calculators have on classroom practice

It was a major expectation of the project that the introduction of calculators would result in changes in teachers' beliefs and practice.

In the UK, the *Calculator-Aware Number* project (CAN), which began in 1986 under the direction of the late Hilary Shuard, was entered into as a curriculum development project. The CAN project, however, found that the calculator's full potential could not be realised without a change in teaching style.

By the end of their third year of involvement in the *Calculators in Primary Mathematics* project most of the seven teachers involved in this aspect of the project claimed to have made substantial changes to their teaching of mathematics.

For example, the teacher who devised the *number line-up* activity reported that she used it, and other similar activities, over and over again. She commented that the activities she now tries to use are ones where the children can "take themselves where they want to go" and that she is never sure what is going to happen. She identified this as a major change in her own teaching of mathematics and believes that she uses many more open-ended activities than in the past.

Other teachers found similar changes in their way of approaching mathematics in their classroom. Moreover, they too found that such re-useable "shells" of activities work better (and with less effort on their part) than the "throw away" ten minute activities often found in commercial publications. These re-useable activities can develop in complexity over time and often lead to surprising results from children.

One of the original hypotheses of the project was that teachers would adopt a more open-ended teaching style as a result of the increased opportunities for exploration of number presented by the calculator. It was also hypothesised that the presence of the calculator would extend the range of problem solving activities in the classroom.

All 7 teachers, at some stage of their involvement in the project, claimed to have become more open-ended in their teaching. However, 2 teachers reported a less open-ended approach in their second year of involvement compared with their first year – mainly due to a perceived need to instruct children on calculator use.

Four teachers spontaneously described their mathematics teaching as having become more like their language teaching – for example, one teacher stated:

> It's becoming a bit more like language where you let children explore their own limits and everything is acceptable. All the approximations and the answers don't have to be correct, as long as the procedure is getting there, and I think it's making the way I look at it a lot more flexible and open-ended.

A majority of teachers also claimed there was more sharing and discussion in their classrooms, which some identified as providing opportunities for observations of children, which in turn lead to teachers catering better for the full ability range. An increase in problem solving activity, often related to the real world, was also identified as a change by 4 teachers.

These changes support the underlying hypotheses of the project and were in line with trends obtained from an initial analysis of the classroom observation data.

Notes

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Jill Cheeseman was a member of the *Calculators in Primary Mathematics* project team and is currently completing her Master of Education thesis at Deakin University on the effect of calculator use on young children's acquisition of number concepts.

The *Calculators in Primary Mathematics* project was funded by the Australian Research Council, Deakin University and the University of Melbourne. The project team consisted of Susie Groves, Jill Cheeseman, Terry Beeby, Graham Ferres (Deakin University); Ron Welsh, Kaye Stacey, David Rasmussen (Melbourne University); and Paul Carlin (Catholic Education Office).

For almost two decades mathematics educators in the UK, USA and Australia have recommended that calculators be integrated into the core mathematics curriculum. Current recommendations on calculator use in Australia can be found in

Australian Education Council. (1990). *A National Statement on Mathematics for Australian Schools.* Melbourne: Curriculum Corporation (Australia).

Results from a survey of 700 teachers carried out by the *Calculators in Primary Mathematics* project indicate a remarkable shift in favour of the early introduction of calculators since a similar survey was carried out ten years earlier. In the 1990 survey, 75 percent of teachers supported calculator use in kindergarten to grade 3, compared to a mere 7 percent in 1980. However, 58 percent of teachers at these grade levels admitted to rarely or never using calculators in their classrooms. Furthermore, while over 80 percent of teachers at all year levels supported the use of calculators to allow for more challenging problems solving situations and also to develop new concepts and skills, 60 percent of kindergarten to grade 3 teachers admitted to rarely or never using calculators for these purposes.

The fifteen *Calculators in Primary Mathematics* project newsletters have been published as

Groves, S. (Ed.). (1994). *Calculators in Primary Mathematics: The Newsletters.* Geelong: Centre for Studies in Mathematics, Science and Environmental Education, Deakin University.

Further details of classroom activities can be found in the video and papers below

Groves, S. & Cheeseman, J. (1993). *Young Children Using Calculators.* [Videotape]. Burwood: Video Production Unit, Deakin University.

Groves, S., Ferres, G., Bergfeld, S. & Salter, S. (1990). Calculators in the infant school: The Victoria College Calculator Project. In M.A. (Ken) Clements (Ed.) *Whither Mathematics?* Proceedings of the 27th Annual Conference of the Mathematical Association of Victoria, pp. 244-250. Melbourne: Mathematical Association of Victoria.

Groves, S., Cheeseman, J., Clarke, C. & Hawkes, J. (1991). Using calculators with young children. In J. O'Reilly and S. Wettenhall (Eds.), *Mathematics: IDEAS.* Proceedings of the 28th Annual Conference of the Mathematical Association of Victoria, pp. 325-333. Melbourne: Mathematical Association of Victoria.

Four different tools – a written test, a test of calculator use and two different interviews – were used over the three year period 1991 to 1993 at grade 3 and 4 levels to determine the long-term effect of calculator use on children's learning of number. In each year, approximately 500 children completed the written test and the test of calculator use, with over 10 percent of these children also taking part in one of the two interviews. Results published to date can be found in

Groves, S. (1993). The effect of calculator use on third graders' solutions of real world division and multiplication problems. In I. Hirabayashi, N. Nohda, K. Shigematsu and Fou-Lai Lin (Eds.), *Proceedings of the Seventeenth International Conference for the Psychology of Mathematics.* (Vol. II, pp. 9-16). Tsukuba, Ibaraki, Japan: University of Tsukuba.

Stacey, K. (1994). Arithmetic with a calculator: What do children need to learn? In G. Bell, B. Wright, N. Leeson & J. Geake (Eds.), *Challenges in Mathematics Education: Constraints on Construction.* Proceedings of the Seventeenth Annual Conference of the Mathematics Education Research Group of Australasia (pp. 563-570). Lismore: Mathematics Education Research Group of Australasia.

Groves, S. (1994). The effect of calculator use on third and fourth graders' computation and choice of calculating device. In J.P. da Ponte & J.F. Matos (Eds.), *Proceedings of the Eighteenth International Conference for the Psychology of Mathematics Education.* (Vol. III, pp. 33-40). Lisbon, Portugal: University of Lisbon.

For further details of changing expectations and curriculum issues see

Groves, S. & Cheeseman, J. (1992). *Calculators in Primary Mathematics: Changing expectations and curriculum issues.* Paper presented at the Joint Annual Conference of the Australian Association for Research in Education and the New Zealand Association for Research in Education, Geelong.

The *Calculator-Aware Number* project (CAN) was a large scale, long term curriculum development project. For descriptions of the project see

Duffin, J. (1989). *Annual report of evaluation of CAN component of PrIME project.* National Curriculum Council Primary Initiatives in Mathematics Education Project.

Shuard, H., Walsh, A., Goodwin, J. & Worcester, V. (1991). *Calculators, children and mathematics.* London: Simon and Schuster.

For further details of changes in classroom practice see

Groves, S. (1993). *Calculators as an Agent for Change: Teachers' Perceptions and Practice.* Paper presented at the Annual Conference of the Australian Association for Research in Education, Fremantle.

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LANGUAGE REVIVAL AND REVERSAL

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LANGUAGES do not just exist inside individuals; they exist inside groups varying in size and strength. Sometimes such language groups shift to insignificance even death. Other times they attempt to spread and not just survive. One argument for the survival of languages has been that as languages die, so does part of the totality of human history and culture.

Just as rain forests and whales have become the subject of environmental protection, so languages may be protected and promoted to effect revival and reversal. This paper focuses on the possibilities of language maintenance, and on optimistic attempts to encourage the growth of a minority language.

A model of language shift and vitality

Before looking at how a language can be revived and reversed it is useful to analyse how language vitality is achieved.

Status factors

The *economic status* of a minority language is likely to be a key element in language vitality. Where, for example, a minority language community experiences considerable unemployment or widespread low income, the pressure may be to shift towards the majority language.

The *social status* of a language – its prestige value – will be closely related to its economic status. When a majority language is seen as giving higher social status and more political power, a shift towards the majority language may occur.

A language's *symbolic status* is also important in language vitality. A heritage language may be an important symbol of ethnic identity, of roots in "the glorious past". The symbolic importance of a language is exemplified in the Celtic countries. In Ireland, for example, the Irish language is sometimes regarded as a mark of nationhood, a symbol of cultural heritage and identity.

Demographic factors

The second factor for language vitality concerns the *geographical distribution* of a language minority group. One part of this is territorial diglossia: two languages having their own rights in different areas within a country. A second part of this factor is the absolute *number of speakers* of a certain language and their saturation within a particular area.

Research in Wales indicates that saturation of speakers within a particular area is important in language maintenance. For example, in communities where over 70 percent of people speak Welsh, there appears to be more chance of the language surviving. Also important is the demographics of biliteracy: where bilingualism exists without biliteracy, there is an increased likelihood of language decay.

At the same time, it is possible for a small language minority to survive when surrounded by the majority language. For example in a large city or in broader areas, a small number of minority language speakers may be socially and culturally active in their minority language. Such speakers may interact regularly and create a strong language cell. The language of children in the home and street may be important for continuation over time.

The idea of demographic factors relates to mixed, *inter-language marriages*. In such marriages, the higher status language will normally have the best chance of survival as the home language. With inter-language marriages specifically, and with language minority communities in general, there is likely to be movement across generations. For example in-migrants may lose their heritage language by the second or third or fourth generation. This highlights the key importance of languages in the home as a major direct cause in the decline, revival or maintenance of a minority language.

Institutional support factors

Language vitality is affected by the extent and nature of a minority language's use in a wide variety of institutions in a region. Such institutions will include national, regional and local government, religious and cultural organisations, mass media, commerce and industry, and not least education. The absence or presence of a minority language in the *mass media* (television, radio, newspapers, magazines, tapes and computer software) at the very least affects the prestige of a language. The use of a minority language in books and magazines, for example, is also important for biliteracy. Research from Wales suggests that it is majority language mass media that is the destroyer of a minority language and culture, rather than minority language television and radio being the salvation of the language. The glossy, high quality of TV English language programmes provides fierce competition for minority languages. Active participation in a minority language is required for language survival; an event that mass media by its receptive nature does not provide.

Religion can be a strong vehicle for the maintenance of a majority and a minority language. The use of classical Arabic in Islam, Hebrew in Judaism, and German among the Protestant Old Order Amish in Pennsylvania each illustrates that religion has been a preserver of language.

Providing *administrative services* in a minority language also serves to give status to that language. It also increases the usefulness of that minority language for communication. The use of languages within educational institutions is probably an essential but not sufficient condition for language maintenance. Where *schooling* in a minority language does not exist, the chances of the long-term survival of that language in a modern society may be severely diminished. Where the minority language is used in the school situation, the chances of survival are greatly increased but not guaranteed.

Community support for bilingual education in the minority language and culture outside school are important. Education by itself cannot enable a minority language to survive. Other supports are essential.

Language revival and reversal

There has been a changing perspective in the topic of language shift from the premise that minority languages, like patients in a hospital or doctor's surgery, will ultimately die to the argument that language shift needs to take the jump of modern medicine by attempting to combat illness and to cultivate "wellness".

The priorities in planning a language shift need to be identified. For example, what is the point of pouring money into minority language mass media and bilingual bureaucracy when home, family, neighbourhood and face-to-face community use of the minority language is lacking? It is like blowing air into a balloon that has a leak. Blowing minority language air in through the mass media and legislation doesn't make a usable balloon because of the unmended hole.

Before presenting a particular plan we look at a basic philosophy and set of assumptions that are required when establishing priorities in reversing language shift.

Assumptions of reversing language shift

First, when a society or community is losing its language and culture, it is likely to feel pain. This hurt may be symptomatic of the social injustice towards that community. Although it may not be a cancer but more like a toothache, to those who experience it, there is real rather than imaginary suffering. Such suffering needs remedying. Second, the basis is that a more global village, a world more unified by mass communication and speedy travel, does not bury the need for local language and local culture. Indeed, a more centrally organised and uniform world may increase rather than decrease the need for language and cultural identity at a local level. Third, and most importantly, the political basis of the plan is to support *cultural pluralism and cultural self-determination*. The destruction of minority languages is the destruction of intimacy, family and community, often involving oppression of the weak by the strong, subjugating the unique and traditional by the uniform and central.

Fourth, an ethnic or culture group that has lost its language is different from that group with their minority language. Language shift accompanies cultural change. This suggests that language shift is not just about language; it is about the attendant culture as well. The argument for language restoration and resurrection must therefore involve a call for cultural change and greater cultural self-determination.

Fifth, to help understand language shift, the relationship between language and culture can be clarified in terms of three links:

1. *A language indexes its culture.* A language and its attendant culture will have grown up together over a long period of history, and be in harmony with each other. Thus the language that has grown up round a culture best expresses that culture. Its vocabulary, idioms, metaphors are the ones that best explain at a cognitive and emotive level that culture.
2. *A language symbolises its culture.* To speak German in the U.S. during World War 1 and France and Britain during World War 2 was not appropriate or acceptable. Not that the allies were at war with the German language. Rather, the German language symbolised the enemy. Therefore, that language was inappropriate in allied countries. A language tends to symbolise the status of that language. A language that is apparently dying may symbolise low status and low income. In certain parts of Ireland and Wales the indigenous language is sometimes perceived as a symbol of the past rather than the present, of disadvantage rather than advantage.
3. *Culture is partly created from its language.* Much of a culture is enacted and transmitted verbally. The songs, hymns, prayers of a culture, its folk tales and shrewd savings, its appropriate forms of greeting and leaving, its history, wisdom and ideals are all wrapped up in its language. The taste and flavour of a culture is given through its language; its memories and traditions are stored in its language.

Sixth, just as there is economic planning, educational planning and family planning, so there can and should be *language planning*. Such planning has as its base the need to re-establish local options, local control, local hope, and local meaning to life.

There is an argument for *status planning* (raising the status of a language within society), and *corpus planning* (concerning the vocabulary, spelling, grammar and standardisation of the minority language) both of which require full consideration of bilingualism and not just planning for the minority language. Where minority languages exist, there is normally the need to be bilingual if not multilingual.

Steps in reversing language shift

The Graded Intergenerational Disruption Scale (GIDS) is an aid to language planning and attempted language reversal. Just as the Richter scale measures intensity of earthquakes, so Fishman's GIDS scale gives a guide to how far a minority language is threatened and disrupted. The higher the number on the scale, the more a language is threatened. The value of the scale is not just in its eight sequenced steps or stages. Rather it provides a plan for action for reversing languages in decline and a set of priorities. See Figure 1.

Figure 1

The Graded Intergenerational Disruption Scale for threatened languages

Stage 8	Social isolation of the few remaining speakers of the minority language. Need to record the language for later possible reconstruction.
Stage 7	Minority language used by older and not younger generation. Need to multiply the language in the younger generation.
Stage 6	Minority language is passed on from generation to generation and used in the community. Need to support the family in intergenerational continuity (e.g. provision of minority language nursery schools).
Stage 5	Literacy in the minority language. Need to support literacy movements in the minority language, particularly when there is no government support.
Stage 4	Formal, compulsory education available in the minority language. May need to be financially supported by the minority language community.
Stage 3	Use of the minority language in less specialised work areas involving interaction with majority language speakers.
Stage 2	Lower government services and mass media available in the minority language.
Stage 1	Some use of minority language available in higher education, central government and national media.

Stage eight represents the "worst case" for a language. A few of the older generation will still be able to speak the language but probably not to each other because they are socially isolated. The few remaining speakers of a language are scattered such that minority language interaction is rarely possible. At this stage it is seen as important that folklorists and linguists collect as much information as they can from these few survivors of the language community. Since the language building is in ruins and the foundations have crumbled, can anything be done to save the language? The one ray of hope is that the records of the language can be used by a younger generation to revive the language. With Australian Aboriginal languages and Cornish in England, this has been attempted. Thus the remnants of the foundations can be reused to start to reconstruct the language.

Stage seven languages will be used on a daily communication basis, but by more mature-age speakers beyond childbearing age. A language used by the older rather than the younger generation is likely to die as that older generation disappears. While the aim for saving a language in stage eight is to reassemble the language, the aim for a language in stage seven is to spread the language amongst the young.

One of the dangers for a language in stage seven is when positive attitudes towards the language are not supported by positive action. Another danger is in the exaggeration of the value of symbolic events in the minority language, on the stage and the written page, in the gathering of the clans and at ceremonies. These events are relatively unimportant in the long term salvation of the language compared with the raising of children in that minority language. However, this is not to argue that such language events are valueless. Their value ultimately lies in indirectly encouraging language life at the daily participative level.

When a language is passed on from generation to generation through child rearing practices, then a language has some chance of long term success, particularly if the teenagers can participate and interact in their minority language at a time when popular majority language culture becomes attractive to them.

Stage six is seen as the crucial, pivotal stage for the survival of a language when it is used between grandparents, parents and children. If the minority language is used in the family, it may also be used in the street, in shops, with neighbours and friends.

This stage essentially concerns the informal use of a language in the home and the community. As such, the language may be supported and encouraged, but it may be outside the realms of formal language planning. As an institution, the family creates and maintains boundaries from the outside that may prevent the majority language from over-intrusion, although the more urbanised twentieth century family does not live in a strong enough castle to prevent considerable outside influence from other languages. Agencies and institutions supporting the home can create a minority language and minority cultural environment (e.g. the availability of minority language nursery schools). What is crucial is that early childhood and teenage socialisation is enacted in the minority language and culture. The danger is in believing that other institutions such as the school, the mass media, the economy and government legislation will reverse language shift in themselves.

Unless a language is transmitted across the generations, other activities may have short term success and long term failure.

Stage five occurs when a minority language in the home, school and community goes beyond oracy to literacy. First, literacy in the minority language is seen to be important because it facilitates alternative means of communication, especially across distance and time. Second, the image and status of a minority language is raised when it is present in print. Such status is not merely symbolic. Literacy in the minority language means that a person is not just subject to majority language print media. Majority language media will contain dominant and powerful viewpoints, the attitudes of the centre, the values and the beliefs of the majority language. Minority language literacy allows the possibility of minority language culture, political and ideological viewpoints to be presented. Third, literacy ensures a much wider variety of functions for a language. Such literacy may open more doors to employment, increase the chance of social and vocational mobility. However, at this stage, literacy in the majority language or biliteracy may be more important than literacy purely in the minority language if such mobility is desired.

Where education is through the majority language, then literacy in the minority language may be achieved through local community effort, via Saturday and Sunday schools, in evening classes and through religious institutions. While such local efforts may be costly in money, they have the advantage of giving control in such literacy education to the community rather than to the central majority language government.

Stages eight to five constitute the minimum basis of reversing language shift where the activities rely solely on the efforts of the language community itself. After stage five comes the attempt to capture the formal functions so far reserved for the majority language (e.g. mass media, compulsory education, political self-determination). It is at this point that the minority language may come out of its enclave and seek to challenge majority language castles.

Stage four – one of the first approaches into the majority language castle may be through education. Schools may be created and supported by the minority language community itself, or by central government. Central government will often still require some control over the curriculum of such schools. That is, minority language medium education may only partly be under the control of the local minority language community. Such schools may need to prove that they are as effective and as successful as neighbouring majority language schools; those attending them not being at a disadvantage but an advantage.

Stage three – in previous stages, some people will use their minority language in a place of work at the "lower work" (local and less specialised work) level and a few such workers will function economically in a relatively isolated way in the local neighbourhood or as a self-contained group. Few bridges will exist with the majority language community. At stage three, creating a wider economic base for the minority language becomes important.

Such economic activity will involve the establishment of minority language staffed enterprises and services, not just for the local market but for national and international markets as well. Such minority language enterprise will, at times, require communication in the majority language. However, the on-the-floor activity and in-house communication may all be through the minority language.

Stage two – the penultimate stage is extending lower government services and mass media into the minority language. Local government institutions may offer their services through the minority language: health and postal services, courts and the police service for example. Telephone and banking services, energy providing bodies and supermarkets may also become willing to use the minority language in their service and communication with the public. The national radio and television may be asked to provide a set number of hours in the minority language.

The particular dangers for languages in this stage may be in the creaming off of the most able and ambitious professionals into majority language positions. Minority language media also face severe viewing competition from Anglo-American, high-budget programmes. The mass media provide status for a minority language, a channel for the minority cultural message, but no salvation for the language in and by itself.

Stage one – the pinnacle of achievement in language shift, where the minority language will be used at university level and will be strongly represented in mass media output, governmental services and throughout occupations. Alongside some degree of economic autonomy will also be cultural autonomy. At this stage the language will be officially recognised in central government legislation or a Language Act.

Throughout the four latter stages stage six is still preeminent. When mass communications, economic rewards and vocational opportunities exist through the minority language, it is still the family, the neighbourhood and community language life that is vital in the long term success of the language. All the trappings of language status (e.g. mass media), all the power of legislation, all the success in economic self-determination does not assure the future of a language. Important as are stages four to one, a language is ultimately lost and won inside the minds and hearts of individuals. While such individuals will doubtless be affected by economic, political and media factors, there is a personal cost-benefit analysis that ultimately determines whether one language is passed on to the next generation or not.

The eight stages of Fishman's graded Intergenerational Disruption Scale (GIDS) must be seen as overlapping and interacting. In language revival, it is not the case of going one step or stage at a time. The myriad of factors in language reversal link together in complex patterns although the more advanced stages cannot normally be secured unless more foundational stages are either first built or repaired. The danger becomes in advancing on all fronts. Attempting to win individual battles without having a strategy for the whole war does not champion success. There is also a danger in working solely for tangible, newsworthy, easily recognised victories. Changing the language of road signs, tax forms and gaining minority language presence on television are battles that have been fought and won in minority language regions. It is more difficult, but more important, to support and encourage the minority language for communication in daily family and community life. It is the informal and intimate spoken language reproduced across generations that is the ultimate pivot of language shift.

Initial activity to reverse language shift will normally derive solely from the minority language community. The language community needs to be awoken and mobilised to support its language, especially at a family and community participative level. However, there may come a time when the majority language government will support that community's efforts to survive. Through the provision of bilingual education, government services and a minority language television service, the central government may come to support its minority languages.

Can schools help?

There is the question of how much *bilingual education* can achieve in reversing language shift. There is sometimes the belief that, where families do not transmit the minority language, the school is there to do it instead. The school may initiate second language acquisition in the minority language. But few students rather than many may use the school-learnt language throughout life, particularly when parenting their own children. Even when a child successfully learns minority language oracy and literacy skills in school, unless there is considerable support in the community and the economy outside school, that language may wither and die. A classroom-learnt second language may become a school-only language.

In order for that language to survive inside the individual, that person needs to become bonded in the language community while at school, and particularly after leaving school. There needs to be a preschool, out-of-school and after-school support and reward system for using the minority language. The minority language needs to be embedded in the family-neighbourhood-community experience. Unless this happens, it is unlikely that bilingually educated children will pass on the minority language to the next generation.

Just as threatened species of animal and plant are threatened, so are many minority languages. In the twentieth century preservation of the environment has become a dominant issue. Maintaining the diversity of nature has developed as part of twentieth century thinking. Preserving language diversity may also be environmentally friendly.

Notes

Colin Baker is Professor of Education and Director of Research Centre Wales at the University of Wales, Bangor. He has published six books under the imprint of Multilingual Matters Ltd.

This is an edited version of Chapter 4, Language revival and reversal, in

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Learning Mathematics IN MAORI

Clive Aspin
Te Puni Kōkiri — Ministry of Maori Development

tahi rua toru wha rima ono whitu waru
iwa tekau tekau ma tahi tekau ma rua tekau ma
toru tekau ma wha tekau ma rima tekau ma
ono tekau ma whitu tekau ma waru tekau ma iwa
45)53
MATHS

Nikki Slade Robinson

E NGĀIWI, e ngā reo, e ngā karangatanga maha o ngā hau e whā, tēnei te mihi atu ki a koutou katoa. Kia mihia te mano tini kua mene ki ngā Hawaiki katoa, rātou te tutūtanga o te puehu, te whiunga o te kupu i ngā wā takatū ai rātou. Heoi, waiho ake rātou ki a rātou, tātou te urupā o rātou mā, ngā waihotanga mai e hāpai nei i ō rātou wawata, tūmanako hoki. Kia ora tātou.

A class of Maori children who were taught in Maori have demonstrated that their mathematics achievement was superior to that of their peers at a neighbouring school who were taught in English. Within the context of 1995, The Year of Maori Language, this study compares these two groups of Maori children. The first language of both groups was English but the group which performed better at mathematics had received all their instruction in their second language, Maori.

The New Zealand Government's decision to accord official status to 1995 as Te Tau o te Reo Māori (The Year of Maori Language) was prompted by widespread concerns among language experts that the Maori language continues to languish perilously close to the brink of extinction. Eight years after the Maori language was recognised as an official language of New Zealand there is increasing pessimism among experts that the language will ever revive from the effects of 150 years of suppression.

Calls for recognition of 1995 as Te Tau o te Reo Māori have come from the highest quarters. Notable among these has been Te Taura Whiri i te Reo Māori (The Maori Language Commission), the body established in 1987 to oversee the development of the language. They have become increasingly concerned about the state of the language and have requested the support of government in drawing the attention of the Maori community and wider society to the plight of the language. According to the estimates of the commission there are about 50 000 native speakers of Maori and possibly another 100 000 who have varying degrees of fluency. This does not auger well for the future of the language when one considers that the majority of native speakers are aged over 50 years of age and that, therefore, their knowledge will be lost to us at a rapid rate over the next few decades.

There has been a concerted effort by Maori over the last ten years to deal with the obstacles that we face in attempting to restore the Maori language to its position as a language of everyday communication. (The Maori Language Commission prefer the term "an ordinary medium of communication" because this emphasises the point that the Maori language can stand on its own as a language to be used at all levels within the community.) Since 1984 we have witnessed the development and spread of Maori language initiatives such as Te Kōhanga Reo (early childhood centres), Ngā Kura Kaupapa Māori (Maori medium schools), Te Ātarangi (family based language learning movement) and Maori broadcasting. Each of these has had a marked positive effect on the viability of the language. Already Maori immersion schools are showing promising signs of success but in the scale of things a great deal more needs to be done if these are to have any tangible long-term effect. Efforts such as these are a mere drop in the bucket compared to the mammoth effort that is required over the next few years.

It is worth, therefore, giving some consideration to the nature of these initiatives so that we might determine their effectiveness in contributing to the ongoing battle to save the language.

It is no surprise that the bulk of present day initiatives have come from within Maoridom. The origins of kōhanga reo can be traced back to 1982 and kura kaupapa Māori can trace their origins to an initiative by Dr Pita Sharples at Hoani Waititi Marae, West Auckland in 1984 which led to the establishment of the first modern day Maori immersion school.

New Zealand is well-placed to learn from overseas examples and this is as much the case with language use as it is with certain other phenomenon. We know from the research that has come from countries such as Canada, the U.S., Australia and Ireland, to name just a few, that children who are taught in their minority indigenous language are likely to achieve better results at school than when they are taught in the majority language. This type of research has direct relevance to us here in Aotearoa/New Zealand now that instruction in Maori is once again an option for a small percentage of Maori children.

Now that kura kaupapa Māori have been a feature of the educational landscape for almost ten years, there are a number of interested parties who want to know whether kura kaupapa Māori are actually bringing any benefits to Maori children. These include parents, teachers, boards of trustees and educational administrators. As we mark 1995 as the official year of Maori language it is timely to consider the effectiveness of these initiatives in carrying out these two key roles.

Maori immersion education has two important roles. Schools where pupils are taught in Maori play an important part in increasing the number of speakers of the language. At the same time there is increasing evidence to indicate that immersion education can play a key role in helping to improve the achievement levels of Maori students. It is clear that the number of speakers is being added to. What is probably more important is the degree to which these speakers will ensure that the language survives.

Maori parents are eager for their children to speak Maori. The present day generation of Maori parents are among those who were denied the opportunity to learn Maori as children and now want to see this deficiency rectified. One mother I spoke to during my research into kura kaupapa Māori typified the situation when she said that she wanted her children to learn Maori so that

> they'll have two languages and not one. They'll have the language that's identified with their race and their culture. I felt at the time when I started them on this that they would fit more comfortably in the world and this has been borne out.

Commentators on the education of minority children have noted the central importance of mathematics in the curriculum and the failure of minority children to acquire mathematical knowledge. It would seem that greater recognition must be given to minority language education if children from minority backgrounds are to achieve the same levels of academic achievement as their majority peers.

It was in response to these concerns that I carried out research at a kura kaupapa Māori. I chose to focus on children's mathematical ability since this is an area of the curriculum that is often used as a gauge by parents to determine the progress that their child is making at school.

The children in the study were aged 10 and 11 years and had received all their instruction in the Maori language, a total of six years at primary school level. A significant number of the children has also been exposed to the Maori language through attendance at kōhanga reo.

The study took place during one school year and looked at two groups of standard four children (year six). The group of primary focus comprised eighteen children who had received their entire primary education in Maori. For most of them this equated to six school years of exposure to te reo Māori as the language of instruction. The comparison group consisted of twenty-five pupils who attended an English medium school located three hundred metres further along the road. Initial interviews with teachers at both schools indicated that the children at the two schools were from similar family backgrounds. A subsequent survey of the families of both groups confirmed this information and showed also that the linguistic influences to which the children were exposed differed from one group to the other. The parents of the kura kaupapa Māori children indicated that instruction in Maori was of prime importance when choosing a school for their children whereas convenience of location was the most important factor for parents at the English medium school. The amount of Maori language to which the children were exposed outside school also differed, with the children at the kura kaupapa Māori receiving a great deal more out of school exposure to the language than their mainstream peers. The principal finding from the questionnaire was that the kura kaupapa Māori parents seemed to have a strong and longer commitment to the revival of the Maori language than the other parents.

The similarity in the family backgrounds of the two groups of children and the fact that both groups used the same mathematics curriculum meant that they made ideal comparison groups. I designed and developed a mathematics test based on the work that had been covered by both classes. The test comprised four topics: addition and subtraction, multiplication and division, measurement, and sets. There were three versions of the test, one in Maori and two in English. The children at the kura kaupapa Māori took the test in both languages and the comparison group took the test in English only. The tests were administered on two consecutive days by the classroom teachers so that both groups were tested in a manner to which they were already accustomed. The format of each test was similar to the mastery tests that came from the curriculum and were used regularly by the teachers as part of their own assessment procedures.

Analysis of the results from these two tests provided evidence that is similar to related studies carried out overseas with children from indigenous minority language backgrounds. These results confirmed the information that we already have from overseas studies. In North America notable results have been achieved at Rock Point on the Navajo Reservation. Children who have participated in the school's bilingual programme have performed better in academic proficiency than their peers in monolingual English programmes.

Australian studies with Aboriginal children have shown the use of language is an important factor for the inclusion of culturally appropriate concepts within the curriculum. A comparative study carried out in the Northern Territory of Australia has shown that a bilingual education programme can have beneficial effects on the mathematical ability of Aboriginal children. Results from this study showed that children from the bilingual programme performed better than the children from the English-only programme in seven out of the ten tests that were administered.

The results from this study of mathematics achievement showed quite plainly that the children who were instructed in Maori were performing at a higher level than their peers who were instructed in English. On both versions of the mathematics test the children at the kura kaupapa Māori scored higher than those who had been taught in English. In fact, the Maori instructed pupils scored even higher on the English version of the test, a fact that could lead one to suggest that they had suffered no disadvantage to their English skills through being instructed in the Maori language.

The children from the kura kaupapa Māori were also interviewed in English. I spoke to a range of the children about the content of the mathematics test. I questioned them about the processes they used in solving mathematical problems and I found that, regardless of their language of instruction, they were still able to articulate mathematical concepts in English in a clear and coherent manner despite the fact that they had received limited exposure to the specialist mathematical vocabulary in English. There were several occasions during the interviews when pupils would use the interviewer's prompts for self-correction. Pupils would sometimes use an idiosyncratic expression to convey meaning and then follow it up with a standard expression.

> *Interviewer:* How did you get this answer here?
>
> *Pupil:* I timesed it. I multiplied the four times thousand, then that equals four thousand, then I plussed that.
>
> *Interviewer:* What does this one come to?
>
> *Pupil:* Four million.
>
> *Interviewer:* Four million, are you sure?
>
> *Pupil:* Forty thousand. Then I plussed the seven times one thousand equals seven thousand. The nine multiplied a hundred equals nine hundred plus that three times one equals three. Then I added it all up and that's the answer.

There was no sign that their mathematical development was being impaired by instruction in Maori.

The results of this research offer encouragement to all those who have placed so much faith in the ability of kura kaupapa Māori to produce capable bilingual speakers. These results show quite plainly that the children at the kura kaupapa Māori were not disadvantaged through being instructed in Maori. Of greater interest to educationalists should be the fact that the Maori-instructed pupils showed distinctly higher levels of mathematics ability than their English-instructed peers.

And so what are the reasons for this difference in performance? It is worth finding answers to this question if we are serious about facilitating the expansion of kura kaupapa Māori to meet the present demands of parents.

It is language that embodies the culture of a people. In kura kaupapa Māori young Maori are surrounded by manifestations of their culture because of the fact that the Maori language prevails. Accordingly, Maori children are more likely to receive positive reinforcement of their self-identity in Maori immersion schools than they would in mainstream English medium schools.

The commitment of parents and staff to the ethos of the school and a high degree of community involvement are important factors that can contribute to the success of kura kaupapa Māori. There was strong evidence of these factors in the school that was at the centre of this research. It was the Maori language that defined the essential character of the school and thus facilitated the incorporation of these factors into the running of the school. Language plays a central role in the transmission of culture from one generation to the next. Rose Pere (1990) encapsulates the essence of this tenet when she writes

> Te Reo [the language] enshrines the ethos, the life principle of a people. It helps give sustenance to the heart of a people. It helps give sustenance to the heart, mind, spirit and psyche.

Language is an essential component for the development and understanding of one's real identity. Maori continue to focus on language in present day attempts to assert themselves within New Zealand society. It is precisely for these reasons that all efforts must be made to ensure that the Maori language survives into the future. Future generations of Maori must not be denied the opportunity of being able to identify themselves fully.

The kura kaupapa Māori movement is one genuine response to the dual perceived needs of Maori as they are positioned in New Zealand society today. They are an attempt to provide Maori youth with an opportunity to achieve at school on an equal footing with their non-Maori peers. And secondly, they are one promising hope for the future survival of the Maori language.

The results from this study show that the kura kaupapa Māori being researched was performing well at both these tasks. The children in the standard 4 class were achieving laudable results in mathematics. Furthermore, they were highly competent bilinguals in both English and Maori. Pupils such as these are indicative of successful attempts to re-right educational imbalances. As speakers of the Maori language they also have a key role to play in ensuring that the language survives for use by generations that come after them.

It is to be hoped the Te Tau o Reo Māori will assist in highlighting the significant contribution that kura kaupapa Māori can play in achieving these two important roles.

Glossary

Kura Kaupapa Māori	–	Maori language schools
Whare Kura	–	Maori language secondary school
Whare Wānanga	–	Degree granting Maori tertiary institution
Kōhanga reo	–	Maori language early childhood centre
te reo	–	language

Notes

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This article is based on his masters thesis in applied linguistics from Victoria University of Wellington.

At the time of writing over 800 kōhanga reo have been established, 34 kura kaupapa Māori have received official recognition, and there are 2 whare kura and 3 whare wānanga.

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Tatari Tautoko Tauawhi

A MAORI LANGUAGE READING TUTORING PROGRAMME

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Kathryn Atvars
Visiting teacher, Special Education Services, Tauranga
Ted Glynn
University of Otago

TATARI TAUTOKO TAUAWHI (TTT) is a Maori language version of the Pause Prompt Praise reading tutoring procedure. Both versions are designed for use in one-to-one oral reading where low-progress readers learn strategies for self correcting mistakes from a parent or peer tutor. The technique involves teaching the tutor to

tatari (pause) before responding to the reader's errors;

tautoko (prompt) the reader to use clues, rather than tell them the correct word; and

tauawhi (praise) the reader's use of independent strategies such as self-correction and correction and correction following prompts.

This article describes the use of TTT in two settings Firstly, we report on the making of the Maori version of the TTT training video and give the results of a preliminary trial using 7 tuakana — teina (tutor — learner) pairs of students from the Maori language immersion class at Maungatapu Primary School, Tauranga; then, we report on a research project at Mount Maunganui Intermediate School using 21 pairs of students from both mainstream and bilingual classes. (See Figure 1 for a summary of the two projects, showing their similarities and differences.)

Our research team comprised classroom teachers, kaiawhina (teacher aides), a Special Education Service Maori visiting teacher and a researcher from the University of Otago Education Department. This article has given each of us the opportunity to record what we learned from this study, as well as to present comments from the tuakana (tutor) and teina (learner) students.

Training video and preliminary trial at School Maungatapu Primary

Kathryn Atvars

Having used the original Pause Prompt Praise (PPP) video and programme to train teacher aides in the Tauranga district, I was aware of its effectiveness and its value to the tutors being trained.

The opportunity therefore to reconstruct these strategies from within a Maori framework and to offer Maori parents and their children these same experiences was one of the main reasons for my getting involved with this work.

Working with the New Zealand Special Education Service, the Ministry of Education and Otago University, filming for a Maori language tutor training video began at Maungatapu school in May of 1992. Careful monitoring of the actual filming by kaumatua and kuia (respected elders) at the school, ensured all of the tutoring examples filmed met with their approval.

Once the video was accepted back in Tauranga, by the kaumatua and kuia at the school, the teachers and parents,

Figure 1 Summary of the two research designs and their outcomes showing where they overlapped.

Maungatapu Whanau Unit 1992–93 (Primary School)

7 teina aged 6–8 years
7 tuakana aged 10–12 years
8 control students 6–8 years

- Students had all had:
  - Kohanga reo training
  - Teaching in Maori Immersion and were confident in Maori
- TTT video used for training
- Tutoring covered 5 weeks
- Tutors tutored in isolation
- Teachers identified tuakana and teina but had little to do with:
  - data collecting
  - tutoring
  - scoring
  - analysing
- Scorer employed
- 3 minute reading in Maori was used to assess students
- Students comprehension not measured
- Parents also trained in TTT

- The research was participant driven
- Teachers were concerned about:
  - reading ability in Maori
  - lack of reading assessment
- Tuakana, teina tutored 12–15 minutes 3 X per week
- Everyone wanted to be involved
- Students able to more effectively:
  - process print
  - practise these skills
  - improve their reading
  - take greater control of their leaning
- Learning for both teachers/students
- Greater confidence to choose challenging material
- More students got 1 to 1 tutoring
- Reading levels of both tuakana/teina went up, error rate went down
- Teachers gave regular feedback
- Students were:
  - reading more slowly
  - more aware of what they were doing
  - processing print more effectively
- Tuakana showed more understanding of different learning styles
- Improved interaction and co-operation
- Students were more successful readers, they enjoyed reading more!

Kia Maia Whanau Unit 1994 (Intermediate School)

26 Tuakana }
26 Teina } Ages 11–13
9 control }

- Students background mainly mainstream or bilingual
- Varied competency of Maori
- Both TTT and PPP video used for training
- Tutoring covered 10 weeks
- Tutors tutored in classroom
- Teachers involved in all aspects of tutoring and data collection
- Tutoring fitted into a "normal" Intermediate timetable
- Syndicate teachers supported by providing release times
- Reading levels were assessed using:
  - 3 minute reading in Maori
  - Maori and English miscue analysis
  - Cloze exercise in Maori
- Parents and students assisted with some data gathering

research to explore the effectiveness of the TTT in Maori medium contexts began. Standard three pupils were selected to train as tuakana (tutors). These seven tuakana were aged between 10 and 12 years and were considered by their teachers as competent readers of Maori. The seven teina (learners) were aged between 6 and 8 years and were selected by their teachers as being likely to benefit most from additional tutoring assistance. A further eight 6 to 8 year old children whom their teachers considered were making good progress were selected to form a comparison group of non-tutored readers. All these children were from the Maori immersion classes at Maungatapu Primary School and had all experienced their early childhood education at kohanga reo (Maori immersion preschool).

In order to judge the success of the training package measures of tuakana tutoring behaviour from three sessions before and from six sessions following tutor training were obtained from tape recordings. In order to judge the success of the actual TTT technique pre and post intervention measures of reading from current classroom texts were obtained from children in all three groups.

During the tutor training tuakana were given three 20 minute training sessions involving careful viewing of the video, with frequent stops to discuss the examples of tutoring provided. Trainers role played readers making different types of errors, so that tuakana could practise using the TTT procedures. Tuakana were also encouraged to use a variety of tauawhi (praise) statements.

During the brief trial of TTT, tuakana-teina pairs spent approximately two or three 10 — 15 minute sessions per week working with trainers in the school's resource room and staffroom. All the sessions were recorded on tape. These interactions were later analysed by the trainers thus providing regular feedback to the tuakana.

The results of this trial showed that tuakana were successful in implementing Tatari Tautoko Tauawhi during the six week trial period. The training proved successful as by the end of the trial they attended to four times more teina errors and doubled their rate of pausing. They more than doubled their use of read on or read again prompts, and they increased their use of specific prompts about word meanings. They maintained a high rate of general supportive praise and more than doubled their praise for prompted corrections.

All tutoring procedures were implemented *i roto i te reo rangatira* (in the Maori language).

Given that these tuakana were learning Maori as a second language, this was a considerable achievement. Delivering prompts about meaning for example requires a high level of Maori language competency.

Data gathered during this brief trial study indicated progress was made by both tuakana and teina. Tuakana showed reduced incorrect reading rates following their tutoring. Similarily benefits to teina were reflected in lower incorrect rates, together with higher correct rates, in contrast with non-tutored children. These data are consistent with the types of gains reported in other studies of peer tutoring with Pause, Prompt, Praise.

TTT at Mount Maunganui Intermediate Bilingual Unit

Mere Berryman

What can we do to cater for the wider range of reading abilities within the class?

Where can we go to get one-on-one individual reading assistance?

Which assessment tools will best enable us to determine the needs of our students in order that we might provide them with better assistance?

Who will take responsibility for our 11, 12 and 13 year olds who are still reading at an emergent or early reading level?

How can we get them to write if we can't get them to read?

Does this sound pretty familiar? You've probably heard it all before. These questions or others similar are asked regularly by many teachers. They are now also being asked increasingly by teachers in Maori medium education where you can add to these problems the fact that many of the teachers as well as their students are learning in their second language.

In an attempt to come to terms with these problems and thus provide better learning for the students in our bilingual and enrichment class, the Kia Maia Whanau unit (the group supporting the bilingual programme) of Mount Maunganui Intermediate School have come up with some interesting ideas and findings.

Tatari, Tautoko, Tauawhi was first formally introduced to the school in 1993 when two teachers received training in the strategies. The decision to implement the programme however did not follow until nearly a year later. The wait was based upon a belief that "we", i.e. the students and teachers, were not ready for it. We were waiting for a person with fluency in Maori; increased fluency levels in students; and appropriate ways to determine Maori reading fluency levels of these students.

The arrival on the staff of Marama Furlong from Maungatapu school provided us with a fluent speaker who was also well versed in the TTT technique. Setting up a TTT programme provided the impetus to get our heads together to consider how we would go about determining the reading levels of our students.

We first researched what other teachers in Maori medium education were using and found a range of assessment tools, from the Progressive Achievement Tests (which were not designed for use in Maori medium education) to running records and cloze procedures. Many teachers relied heavily upon their intuitive knowledge of their students' achievement. The TTT research provided us with another method – three minute running records from which correct and incorrect reading rates could be established.

In accepting the challenge of trying all these measures we were rewarded by being able to establish a more in depth picture of our students as they develop in their ability to talk, read and comprehend in their second language, Maori. We assessed the 26 tuakena-teina pairs and 9 control students before and after the 10 week TTT trial. The assessment tools we used were:

Miscue analysis in English

As English is for all of us our first language we needed to be able to monitor what effect if any, reading in Maori was going to have upon reading in English. We also wanted to know if there were any other changes taking place especially with students' ability to comprehend what they were reading. Five comprehension questions were asked with each selection. Because 90 percent of the students in the two classes studied were of Maori descent we used a selection of texts taken from school journal stories which had a Maori bias. These prose selections were all administered by the same teacher following procedures that were based on LARIC Unit 8 – A Focus on One, 1984.

Miscue analysis in Maori

We used translated reading samples and then followed the same procedures as with the miscue analysis in English. Our teacher with the greatest fluency in Maori was responsible for all of the data collection in this area. The whole procedure was carried out in Maori.

Apart from the language difference the only change from the English miscue was with the five comprehension questions per selection. In this initial study, the majority of the comprehension questions were seeking recall of information. In this section of the testing a non response allowed the teacher to repeat a question again. Students were able to use the text to find the answer while the teacher recorded the number of attempts made. This allowed our students with little ability in Maori to still feel safe within the testing situation.

Three minute reading samples

Based on a three minute sample of oral reading in Maori the following measures were taken:

- reading accuracy (i.e. percentage of words read correctly)
- number of words read correctly per minute

- number of words read incorrectly per minute
- the percentage of errors self-corrected.

Cloze selections

We decided to include these because we were concerned that the three minute samples told us how the students were doing with their reading but not with their comprehension. Again we used a different set of translated reading samples. Students were all given the same unseen cloze sample with 15 minutes to process it. Marking of cloze passages took into account the word intended by the author as well as a range of other words that retained sense within the context of that selection.

Translated reading levels

As only one out of the three teachers involved was fully fluent in Maori we decided to use the school journal stories translated into Maori that are now being published by Learning Media in the Ngā Kōrero series as the basis for all of our data gathering in Maori. This meant all teachers had easy access to understanding the prose selections being used whether they were in English or Maori. We also made the decision to use the English reading level as identified by the Elley noun frequency. We gave the translations which appear in our Maori reader the same reading level as the English equivalent level. We do not contend that these levels are in any way accurate reflections of "Maori Reading levels". However, until further research is done in the area of identification of accurate and consistent Maori Reading levels, our translated reading levels serve merely as an index of progress through different texts made by individual children. Stories selected include samples of fictional and factual writings at each level except those below level six. Stories were selected as much as possible with the Maori readers' background knowledge in mind.

Startling results

Results of the assessment of reading level at the beginning and end of the 10 week TTT trial indicated that all students, the tutors and the learners, made progress with their reading in Maori and in English.

We had expected those students with the least knowledge of Maori to make the most dramatic gains. However, we were pleasantly surprised to see that all students valued this opportunity to improve their reading skills in Maori and enjoyed the co-operative learning style that was being used to facilitate this.

It was even more surprising to see that both the tutors and learners also showed tangible improvement in their reading in English.

I can say I'm impressed by TTT. I've never seen a "single thing" have such a major and positive influence on the Maori programmes within the school. At long last the Maori stories are being read as part of a Maori reading programme, rather than to assist and support other programmes in place. They are being used in their own right. They are being used with confidence and enjoyment.

Accepting the challenge

Pauline Bidois

In 1993 I attended a TTT training course. I was impressed with what the programme had to offer. However, I had serious reservations about my own limitations in Maori and how effectively I could implement a programme such as this.

My questions were: "Who would train the parents? Would I get parents? Could I select appropriate material? Do we have appropriate material? How could I monitor progress?" And many more.

All I could see ahead of me were a lot of hurdles and a lot of work. None of which I felt ready for yet. One thing I did know was that given the right circumstances I would welcome the programme in my class. But, I knew I would need help.

In 1994 our single bilingual class expanded to two classes with the new teacher being fluent in Maori and experienced in TTT strategies. Rangiwhakaehu Walker became the kaiawhina for our classes and Mere Berryman had returned from taking leave. Surrounded by these people and with their involvement with TTT it was feasible that it could now become part of our programme. We decided that TTT would be introduced using peer tutors (tuakana-teina). Marama (the new appointee) and Mere would take a lead role in the training of the tuakana and the initial assessment.

I was happy to support them in whatever way I could. I lacked confidence in my ability to be a part of the assessment team at this stage. My role, as I saw it, was to offer release time to them so that they could gather and analyse the pre-tutoring data.

Pressure to get assessment done in order to begin tutoring was mounting. The need to offer my limited services became more obvious to me. The offer was taken up immediately. Administering the cloze exercise was fine, marking them, a little more difficult. Then came the taped tutoring – yes, I could do that, in fact I got good at it. These were followed by the 3 minute reading records – my goodness I could do those too!

"What else do you want Berryman? I'll do it!"

The results were coming in hard and fast and there was a certain amount of excitement discovering just how much my students were really capable of and seeing how much improvement they had made from when they had first entered my class.

These results were concrete evidence that even though I had imitations in the *reo* (language) what I had been doing with them was working. They were learning and improving and I now had the tools to determine where and how they were progressing. Was it possible that I could take them beyond my limitations in a structured, meaningful way? I now wanted very much to be part of the total package. The post tutoring data collection made it all worthwhile. I now feel confident to continue with the programme and on my own if I had to. I can now do all of the necessary assessment required, mark, analyse and collate data. A lot of learning has been done by the students but there has been even more learning for me. In 1995 we hope to develop other programmes of work to complement what we have started this year and to further work in TTT. I look forward to this and will be a keen starter rather than an unsure bystander.

Co-operative learning for all ages

Marama Furlong

Being involved in TTT at Maungatapu Primary and then Mount Maunganui Intermediate has enabled me to gain indepth appreciation into how this programme works for both Maori and Pakeha students. I was able to observe them as they achieved successfully in reading. It was interesting to observe the progress made by the pupils of different age groups.

The other value gained from this style of programme was the social aspect that resulted from the interaction between tuakana and teina and their wider class peers. Peer relationships improved and there was a greater enthusiasm to work co-operatively. I am very fortunate to have had the opportunity to be part of this experience with both junior and intermediate students.

Also, in the short time we have had TTT going there has been a definite difference to the students' overall self esteem, but in particular in their valuing of things Maori, whether it be reading, *reo* or culture. A definite individual growth has been noted right across the board from the slower to the brighter. Because many of these students had not experienced Maori language immersion to any extent they were really appreciative of the development in this area and have taken to it enthusiastically. They really value this activity and don't take it for granted.

Extracts from our interview with Rangiwhakaehu Walker, one of the respected elders who acts as kaiawhina (teacher aide) at Mount Maunganui Intermediate show the value of the programme for co-operation with those of different ages and an improved awareness of the Maori culture.

What were some of the highlights for you of this particular research Aunty Nan?

> Seeing the changes in the tamariki (children). Their confidence has built up and they are now having a go. Some were brats to begin with. Then I saw the change in them, doing their mahi (work) in Maori. They began to see Maori in a different perspective. I enjoyed using the harakeke paora (flax ball) with them to review and learn kupu tautoko (prompt words) and kupu tauawhi (praise words). I also enjoyed taking the tamariki for their 3 minute reading records.

Kia ora Aunty Nan. What about making some comments on changes you might suggest for further TTT research?

> We should have spent more time training the tuakana in Maori giving them more encouragement to use a greater variety of tauawhi (praise). Eight pairs of children for me to work with was too large a group at the beginning. It was better though when the numbers were reduced.

Comments from the students

At the end of the TTT programme, students responded anonymously to an appraisal sheet. These responses have been selected from their written appraisals.

How did you benefit from the tuakana teina TTT?

Tuakana response

- I benefitted by helping others. It helped me to pick up most of my own mistakes when I made them.
- I learnt how to tutor. I now understand more Maori words. I now know how to structure sentences better. It gave me confidence to speak reo in front of people.
- I benefitted from this programme by learning more of te reo Maori and also by learning to teach another person.
- I learnt about not telling them what the word was until they had attempted it and I also improved my reading. I learnt new words I had never heard of before and learnt their meanings.

Teina response

- I found that I could understand the Maori I was reading and could pronounce words that I couldn't before.
- It helped me pick up my mistakes.
- I learnt more Maori words and I understand the words without looking at the pictures.
- I got a lot better at reading Maori books and understanding them.
- I learnt about saying the word all by myself.

What would you tell another student starting this programme?

Tuakana response

- That it would be a great start for their reo.
- If you are a tuakana you have a responsibility.
- This is an excellent programme. If the opportunity comes for you to do it you should take it. It improves the Maori reo for not so good and good Maori readers.
- It's a good opportunity to improve your reading as well as helping another person.

Teina response

- You will learn heaps about Maori words and phrases.
- To be confident in yourself and don't be afraid to try.
- Don't worry about things because your tuakana is there to help you.
- It's going to be fun, enjoy yourself and try your best.

What would you tell the teachers?

Tuakana response

- I liked the TTT programme.
- Keep trying to improve this programme, the better it is, the better the students will want to join in and partake of it. Good luck.
- It was a good programme and I would like to do it [again] some day in the future.

Teina response

- I would tell the teachers to keep up their good work.
- Have it more – every day.
- That it's an excellent programme, it really helped me.
- It was choice doing TTT or PPP.
- I enjoyed it and can't wait to do it next year.

A researcher's view

Ted Glynn

For me, the results emerging from these two schools are exciting and affirming. Peer tutoring is a culturally appropriate and highly effective means of assisting children to read in Maori. In both studies the teina (learner) children made marked gains in reading level, reading accuracy, reading rate and comprehension. In the intermediate school tuakana (tutor) children also made major gains on all these measures. Clearly taking responsibility for helping younger learners does *not* lead to poorer performance on your own reading. Quite the reverse, these data suggest not only did the tutor children gain in reading skills as a result of implementing TTT, but also their comments demonstrate they learned a great deal about the reading process and how to evaluate reading progress.

Further, it is also clear that time and effort spent in learning to read in Maori does not result in poorer performance in reading in English.

These results are consistent with findings in bilingual education generally, in that a high level of competency in speaking, reading and writing in one language facilitates, not inhibits, acquiring these skills in a second or subsequent language. In the context of the revival of the Maori language and culture in Aotearoa/New Zealand, TTT seems capable of making a worthwhile contribution to improving Maori language reading skills in children in Maori medium education. These results suggest that worthwhile Maori language reading gains can be made even in a context where not all teachers are fluent Maori speakers. However we need to acknowledge the exceptional commitment of the Maori staff and community at Maungatapu and Mount Maunganui schools which, with the support of the principal, board of trustees, and syndicate teachers at Mount Maunganui Intermediate allowed students and teachers to work co-operatively in further developing the reading tutoring resources and assessment tools in Maori. We must commend all educationalists, communities and programmes that are working to revive the Maori language and culture and improve the achievement of Maori students.

Glossary

tatari	–	pause
tautoko	–	prompt
tauawhi	–	praise
tuakana	–	tutor
teina	–	tutee
kaiawhina	–	teacher aide
kaumatua	–	respected male elder
kuia	–	respected female elder
kōhanga reo	–	Maori language preschool
reo	–	language
tamariki	–	children
mahi	–	work
kia ora	–	thank you (in this context)

Notes

Mere Berryman, Pauline Bidois and **Marama Furlong** are classroom teachers at Mt Maunganui Intermediate, Tauranga, New Zealand.

Kathryn Atvars is a visiting teacher, Special Education Services, Tauranga, New Zealand.

Ted Glynn is Professor of Education at the University of Otago, Dunedin, New Zealand.

A summary of the Pause Prompt and Praise technique can be found in

Glynn, T. (1994). Pause Prompt Praise: seventeen years on. *Best of* **set**: *families and schools*, Item 13.

A booklet and a video showing the technique in action is available. Write to: The Learning Shop, Box 12188, Wellington, for

Glynn, T., Dick, M., & Flower, D. (1992). *Pause, Prompt and Praise Reading Tutoring Procedures. Tutor's booklet.* Wellington: Special Education Service.

and

Dick, M., Glynn, T., & Flower, D. (1992). *Pause, Prompt and Praise Reading Tutoring Procedures. Tutor training video.* Wellington: Special Education Service.

Further research in Tatari Tautoko Tauawhi can be found in the following:

Atvars, K., Berryman, M., & Glynn, T. (1994). *Tatari Tautoko Tauawhi: A resource manual for staff.* Tauranga: Special Education Service.

Atvars, K. & Glynn, T. (1992). *Tatari Tautoko Tauawhi: Hei Awhina Tamariki Ki te Panui Pukapuka* (video). Dunedin: University of Otago, Higher Education Development Centre, A-V Production Section.

Glynn, T., Atvars, K., Furlong, M., Davies, M., Rogers, S., & Teddy, N. (1993). *Tatari Tautoko Tauawhi: Hei awhina tamariki ki te panui pukapuka.* Some preliminary findings. *Cultural Justice and Ethics Symposium Report.* Wellington: New Zealand Psychological Society.

Glynn, T., Atvars, K., Furlong, M., & Teddy, N. (1993). From Pause Prompt Praise to Tatari Tautoko Tauawhi: A bicultural process of adaptation. In Barratt, Gold & Lawn (Eds), *Towards Excellence: Providing Effective Services for Learners with Special Needs.* Inaugural Conference of the Special Education Service. Dunedin.

Glynn, T., & McNaughton, S.S. (1985). The Mangere home and school remedial, reading procedures: Continuing research on their effectiveness. *New Zealand Journal of Psychology, 15* (2), 66-77.

Glynn, T., & McNaughton, S.S. (1987). The Mangere home and school remedial reading procedures: Continuing research on their effectiveness. In S. McNaughton, T. Glynn, & V. Robinson (Eds), *Pause, prompt praise: Effective tutoring of remedial reading.* Birmingham: Positive Products.

Harawira, W., Glynn, T., & Durning, C. (1993). *Tatari Tautoko Tauawhi: Hei Awhina Tamariki ki te Panui Pukapuka.* Tauranga: Tauranga Special Education Service.

Wheldall, K., & Mettem, P. (1985). Behavioural peer tutoring: Training 16 year old tutors to employ the 'pause, prompt and praise' method with 12 year old remedial readers. *Educational Psychology, 5,* 27-44.

LARIC (Language and Reading Inservice Course). Unit 8 A Focus On One (1984). Wellington: Department of Education.

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Building Bridges to Individuals:

MAXIMS FOR TEACHING COMPOSITE CLASSES

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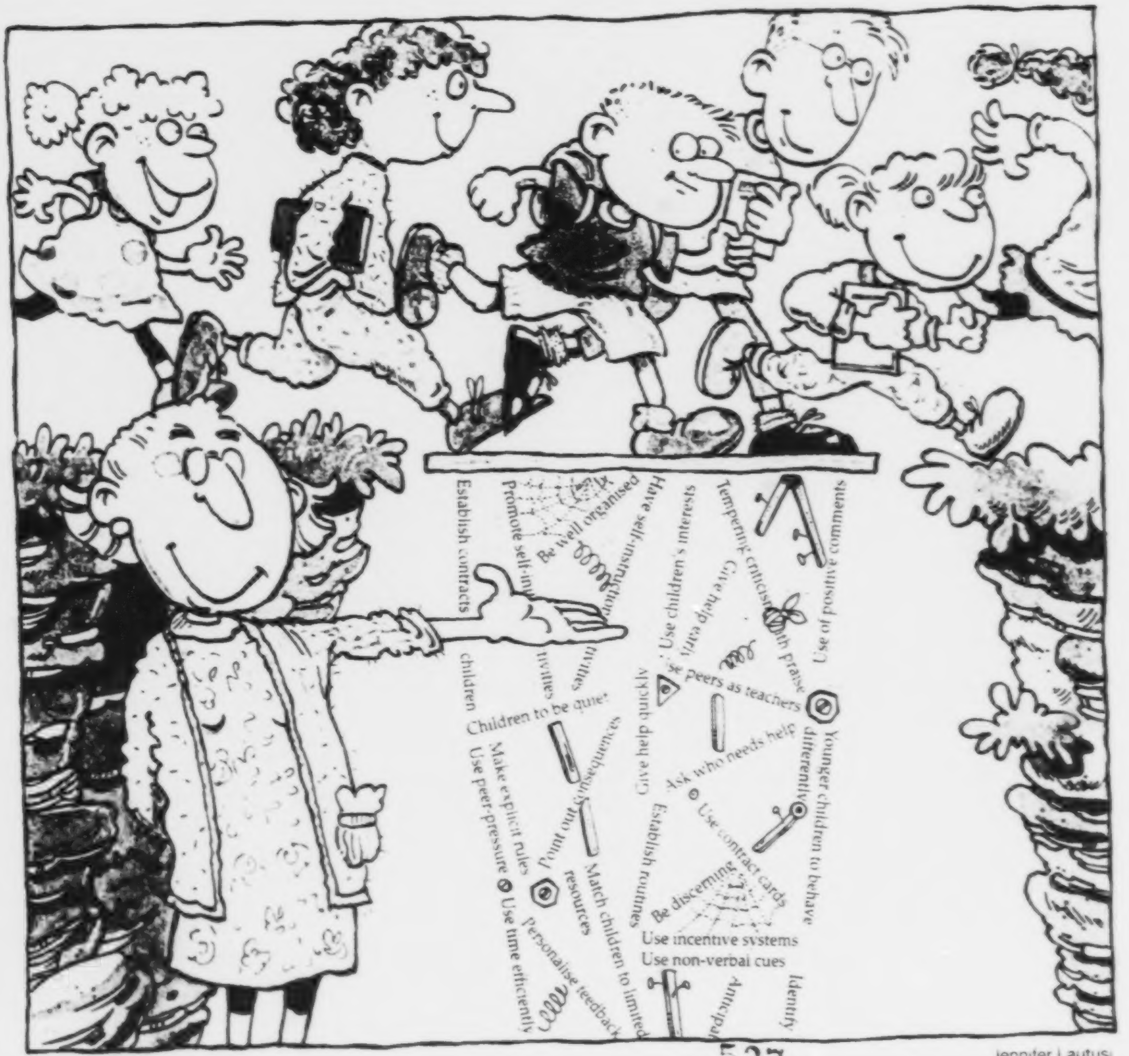
University of New South Wales


Establish contracts
Promote self-in
Be well organised
Have self-instruction
Use children's interests
Tempering criticism with praise
Use of positive comments
Give help early
children
tivities
tivities
Children to be quiet
se peers as teachers
Younger children to behave differently
Give help quickly
Ask who needs help
Make explicit rules
Use peer-pressure
Point out consequences
Match children to limited resources
Establish routines
Use contract cards
Be discerning
Use incentive systems
Use non-verbal cues
Use time efficiently
Personalise feedback
Anticipa
Identify

Jennifer Lautusi

THE STUDY of the knowledge and practice of outstanding teachers has been strongly advocated because it is likely to yield valuable insight for both practitioners and beginners. This research used classroom observation and teacher interviews with outstanding primary school teachers in composite classes to make their practices and insights accessible to others.

Composite classes

A composite class is formed by taking children from two or more grade levels and putting them together as one class. In 1988, 21.7 percent of all primary classes in New South Wales were composites, rising to 29.5 percent by 1992, and a child's chance of being in a composite rose from 19.5 percent in 1988 to 27.4 percent in 1992.

Not that some of the people in the schools seemed to mind. One principal who had five composite classes of up to 32 pupils in her school was quoted in a local newspaper as saying, "I can't see anything wrong with composites of two classes. I have very good and competent teachers and they can handle them." A small inner-city Catholic school boasted three composite classes each made up of 25 children ranging in grade level from kindergarten to year 6 (J1 to form 1). One of the parents is reported to have said, "The nice thing about the school is the family atmosphere. It is very good for the young ones to have the influence of the older ones." Andrew, five years of age, claimed he had friends in kindergarten, year 4 and year 6.

The majority, however, have not been so enthusiastic. Composite classes can be unpopular with schools, teachers and parents. To schools they present management problems, to teachers an increase in workload and to parents the spectre of their child being asked to do work which is pitched at a grade level either beyond or below his or her capacity or of repetition of aspects of the curriculum. Research indicates, however, that there is no difference between the academic performance of children in the two situations whilst the composite classes seem to have a beneficial effect on socio-emotional development and on attitude to school.

The prevalence of composite classes means that it has become increasingly likely that new teachers will find themselves teaching composite classes.

There are very few preservice and inservice courses on composite class teaching, and surprisingly little has been written about it. There are some handbooks containing valuable suggestions for preparation, organisation, management and curriculum, and there is some amount of case study material. Those books which give practical advice tend to do so without reference to the classroom context or experience.

Maxims

A little-tapped source of insight about how to teach composite classes lies in the knowledge of competent teachers of those classes, including their tacit knowledge. Classroom studies can provide *cases*, that is, reports of specific, richly described events or teaching incidents. Two ways to provide insight into this teacher knowledge are to observe and record what teachers do as they teach composite classes; and to ask teachers what they know about how best to teach in composite classes. A combination of the two is desirable. Having a highly competent teacher as observer and then providing for the observer and teacher to interact to seek explanations is even more desirable. From the explanation which emerges, a classroom incident can become a springboard for educing a *maxim* – a short pithy expression offering a guideline for practice. "A stitch in time saves nine" is such a maxim, widely used to extol the virtues of being well-prepared, anticipatory in behaviour and proactive in many situations. Our goal was to identify these maxims for teachers of composite classes and therefore make some of the tacit knowledge of teachers of composite classes more explicit, and hopefully more accessible. Many of the maxims would probably apply in contexts other than composite classrooms.

Method

This research started with the assumption that outstanding teachers working with composite classes would provide some of the wisdom of their practice. It was considered that what these teachers did, and why they did it, was worth recording in a form which might be helpful to other teachers who are preparing to teach, or actually teaching, composite classes. The study had four stages.

1. Outstanding teachers of primary composite classes were identified.
2. These teachers were observed and interviewed in order to record how they taught.
3. Material was analysed and maxims written.
4. The maxims were validated, in order to gain some sense of the extent to which a maxim represented the shared wisdom of professionals in these classrooms.

Results

The 125 incidents, statements of teacher knowledge and maxims were produced in a booklet used in the validation study. Table 1 summarises the maxims and shows the extent of agreement among teachers.

This table also indicates that what teachers know to do in composite classes can be classified under six broad headings: management, personalisation, class climate, teaching strategies, curriculum and teaching contexts. In most cases, sub-categories of what teachers know to do were also discernible and are presented in Table 1.

Table 1 reveals that most maxims (102/125) were strongly supported by most teachers (over 75 percent) and there were 26 instances when *all* the teachers who responded indicated that they agreed either strongly or very strongly with a maxim. Only 23 of the maxims obtained strong support from less than 75 percent of the teachers.

The 21 teachers who participated in the validation phase of the study were asked about the usefulness of the incidents and maxims for teacher professional development and the value of the exercise for their own professional growth. More than 80 percent stated that they thought the maxims would be "a great deal of help" to both preservice and inservice teachers. If a similar activity was to take place in the future, 91 percent said they would like to participate again.

Table 1

Extent of Agreement with Maxims for Composite Class Teaching

		Not at all %	A little or moderate %	Strongly or very strongly %	Total N
1.0	**MANAGEMENT**				
1.1	**TRANSITIONS**				
1.1.1	Use whole class activities	-	28.6	71.4	21
1.1.2	Break up long sessions	-	9.5	90.5	21
1.1.3	Change faltering activities	-	9.5	90.5	21
1.1.4	Gain attention non-verbally	-	-	100.0	21
1.1.5a	Ask who needs help	4.8	19.0	76.2	21
1.1.5b	Use time strategically	-	14.3	85.7	21
1.1.6	Staggered starting points with unfamiliar work	9.5	33.3	57.1	21
1.1.7	Simultaneous starting points for work	-	19.0	81.0	21
1.2	**SUPERVISION**				
1.2.1	Give help early	-	28.6	71.4	21
1.2.2	Help at the pupils' desks	4.8	4.8	90.5	21
1.2.3	Give help quickly	-	4.8	95.2	21
1.2.4	Get children working quickly	-	19.0	81.0	21
1.2.5	Get children to self-correct immediately	-	9.5	90.5	21
1.2.6	Have multiple-grade awareness	-	-	100.0	21
1.3	**DISCIPLINE**				
1.3.1	Make explicit rules	4.8	28.6	66.7	21
1.3.2	Use peer-pressure	4.8	28.6	66.7	21
1.3.3	Point out consequences	-	4.8	95.2	21
1.3.4	Permit productive talk	-	14.3	85.7	21
1.4	**INTERVENTIONS**				
1.4.1	Settle the class	-	4.8	95.2	21
1.4.2	Use incentive systems	-	14.3	85.7	21
1.4.3	Use non-verbal cues	-	4.8	95.2	21
1.4.4	Be discerning	-	4.8	95.2	21
1.4.5	Isolate misbehaving children	-	9.5	90.5	21
1.4.6	Minimise the intrusion	-	14.3	85.7	21
1.4.7	Relate to learning	-	4.8	95.2	21
1.4.8	Anticipate problems	-	-	100.0	21
1.5	**EXPECTATIONS**				
1.5.1	Children to be self-directive	-	10.0	90.0	20
1.5.2	Children to be quiet	-	-	100.0	20
1.5.3	Children to self-correct	-	-	100.0	19
1.5.4	Younger children to behave differently	9.5	14.3	76.2	21
1.5.5	Children's attention span to vary	9.5	4.8	85.7	21
1.6	**TASK SETTING**				
1.6.1	Have back-up activities	-	10.0	90.0	20
1.6.2	Have self-instructional activities	-	9.5	90.5	21
1.6.3	Promote self-initiated activities	-	5.0	95.0	20
1.7	**ORGANISATION**				
1.7.1	Split your supervision time	-	28.6	71.4	21
1.7.2	Identify "quick" problems	14.3	42.9	42.9	21
1.7.3	Keep a "forward" press	-	9.5	90.5	21
1.7.4	Establish routines	-	4.8	95.2	21
1.7.5	Use time efficiently	-	4.8	95.2	21
1.7.6	Differentiate teacher contact time	-	14.3	85.7	21
1.8	**RESOURCES**				
1.8.1	Match children to limited resources	-	9.5	90.5	21
1.8.2	Use contract cards	-	14.3	85.7	21
1.8.3	Be well organised	-	-	100.0	21
2.0	**PERSONALISATION**				
2.1	**SENSITIVITY TO INDIVIDUALS**				
2.1.1	Awareness of personal problems	-	4.8	95.2	21
2.1.2	Use of personal jokes	10.0	10.0	80.0	20
2.1.3	Provision of support	-	5.0	95.0	20
2.1.4	Emphasise the positive	-	-	100.0	21
2.2	**EXPECTATIONS**				
2.2.1	Differ across age levels	-	28.6	71.4	21
2.2.2	Vary according to emotional state	-	9.5	90.5	21
2.2.3	Match to learning capacity	-	4.8	95.2	21
2.2.4	Differ across grade levels	4.8	14.3	81.0	21
2.3	**TACTICS**				
2.3.1	Use children's interests	-	9.5	90.5	21
2.3.2	Use children's strengths	-	-	100.0	21
2.3.3	Use concrete materials	-	4.8	95.2	21
2.3.4	Establish contracts a. Disruptive children	-	10.5	89.5	19
2.3.5	Establish contracts b. Gifted children	-	10.0	90.0	20
2.3.6a	Establish individual baselines	-	10.0	90.0	20
2.3.6b	Personalise feedback	-	-	100.0	20
2.3.7	Use regular systematic observation	-	-	100.0	20
2.3.8	Help overcome individual weaknesses	-	-	100.0	20
2.3.9	Use peers as teachers	-	5.0	95.0	20
3.0	**CLASS CLIMATE**				
3.1.0	**GRADE AND CLASS IDENTITY**				
3.1.1	Compare work to other non composite grades	22.2	16.7	61.1	18
3.1.2	Sometimes treat grades differently	-	33.3	66.7	18
3.1.3	Establish grade and class identities	5.3	21.1	73.7	19
3.1.4	Preserve grade identities	15.0	30.0	55.0	20
3.1.5	Relate degree of difficulty to grade	15.0	40.0	45.0	20
3.1.6	Develop self-esteem through differentiated work	-	16.7	83.3	20
3.1.7	Tell children their work matches their grade	15.0	15.0	70.0	20
3.1.8	Reinforce grade identities	5.0	35.0	60.0	20
3.2.0	**PHYSICAL AND SOCIAL ENVIRONMENT**				
3.2.1	Create a stimulating classroom	-	-	100.0	20
3.2.2	Selectively ignore off-task behaviour	15.0	30.0	55.0	20
3.2.3	Facilitate across-grade cooperation	-	15.0	85.0	20
3.2.4	Rearrange the classroom	5.0	35.0	60.0	20
3.2.5	Involve children in classroom design	5.0	30.0	65.0	20
4.0	**TEACHING STRATEGIES**				
4.1	**TECHNIQUES**				
4.1.1	Sequencing of questions	-	14.3	85.7	21
4.1.2a	Transfer of learning	-	4.8	95.2	21
4.1.2b	Incidental teaching	-	-	100.0	20
4.1.3	Use of prompts and cues	-	4.8	95.2	21
4.1.4a	Use of pupil feedback	-	9.5	90.5	21
4.1.4b	Develop learning strategies	4.8	9.5	85.7	21
4.1.5a	Use a grid to test tables	5.3	31.6	63.2	19
4.1.5b	Encourage divergent responses	-	4.8	95.2	21
4.1.6	Use humour	-	-	100.0	21
4.1.7a	Develop many skills simultaneously	-	28.6	71.4	21
4.1.7b	Teach grammar in context	-	9.5	90.5	21
4.1.8	Readjust to overcome obstacles	-	4.8	95.2	21
4.1.9	Extend engaging activities	-	9.5	90.5	21

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4.2	**GROUPS**				
4.2.1	Awareness of group mood	-	19.0	81.0	21
4.2.2	Differentiate feedback across grades	-	-	100.0	21
4.2.3	Teach both grades together	-	9.5	90.5	21
4.2.4	Have groups evaluate themselves	-	-	100.0	21
4.2.5	Provide group help	-	30.0	70.0	20
4.3	**PEERS**				
4.3.1	Capitalise on across-grade friendships	-	-	100.0	21
4.3.2	Capitalise on learning strategies of competent children	-	9.5	90.5	21
4.3.3	Use peer awards to promote neatness	4.8	47.6	47.6	21
4.4	**ASSESSMENT AND EVALUATION**				
4.4.1	Develop systematic testing procedures	-	15.8	84.2	19
4.4.2a	Use within grade competition	5.0	30.0	65.0	20
4.4.2b	Use peer assessment	-	19.0	81.0	21
4.4.3a	Use of checklists	-	11.1	88.9	18
4.4.3b	Share information on progress	-	14.3	85.7	21
4.5	**CORRECTION**				
4.5.1	Public correction	-	15.0	85.0	20
4.5.2	Use of positive comments	-	-	100.0	20
4.5.3	Tempering criticism with praise	-	-	100.0	20
4.5.4	Multipurpose activities	-	10.0	90.0	20
4.6	**CONTENT**				
4.6.1	Attend to wholes	-	11.8	88.2	17
4.6.2	Probe to find the real problem	-	-	100.0	20
5.0	**CURRICULUM**				
5.1.1	Suit tasks to grade backgrounds	10.0	15.0	75.0	20
5.1.2	Different levels, different grades	-	10.0	90.0	20
5.1.3	Extend individuals across grades	5.3	21.1	73.7	19
5.1.4	Relate means to ends	-	15.0	85.0	20
5.1.5	Monitor grade progress	-	5.0	95.0	20
5.1.6	Use the full curriculum band	-	15.8	84.2	19
5.1.7	Criss-cross the grade barriers	-	-	100.0	20
5.1.8	Cross key learning areas	-	-	100.0	20
5.1.9	Build on successive lessons	-	-	100.0	20
5.1.10	Go outside the curriculum	-	5.0	95.0	20
5.1.11	Be well prepared	-	-	100.0	20
6.0	**TEACHING CONTEXTS**				
6.1.1	Make policy on successful composite class membership	5.0	20.0	75.0	20
6.1.2	Articulate the curriculum across years	-	15.0	85.0	20
6.1.3	Prepare flexible and relevant curriculum	-	-	100.0	19
6.1.4	Link rewards to the school system	-	20.0	80.0	20
6.1.5	Use whole-school motivational strategies	-	10.0	90.0	20
6.1.6	Define whole-school learning processes	-	5.0	95.0	20
6.1.7	Recognise school and community expectations	-	10.0	90.0	20

Discussion

One of the most striking results is the great extent of the tacit knowledge teachers have. The 125 maxims generated by the observation and interview of teachers cover a broad span of knowledge.

For many maxims there was a high level of agreement by outstanding composite class teachers. Looking at three areas, personalisation, management and class climate, the following shows examples of what "good" teachers do.

Personalisation

Inspection of the data in Table 1 indicates that teachers agreed with many maxims in this area. "Agreement" meant that, for example, "To emphasise the positive in pupil performance on a task" was a good teaching behaviour to use in a composite class. A clear majority of maxims in this area attracted strong or very strong agreement from 95 percent or more of the outstanding teachers. The maxims under this heading show that outstanding teachers relate their professional teaching skills to their intimate knowledge of each child as they attempt to promote learning. The researchers were not surprised by this result. Indeed, our overwhelming impression was that one of the major reasons these teachers were outstanding was because they knew and understood each child so well and they used this knowledge to manage, correct and stimulate children's learning.

To illustrate, the key idea of one incident was "personalise feedback". The incident, which occurred in a year 3/4 class (standard 2/3), was, "In a handwriting lesson the teacher personalises the feedback to each child", e.g., "John, that's a much better slope on your letters than before". When asked to explain the knowledge which informed this behaviour the teacher said, "At the beginning of the year I collect two writing samples from each child and this makes me aware of the level at which each child writes. The programme is built on these baselines." The maxim educed by the researchers and endorsed by all of the outstanding composite class teachers was, "Personalise the feedback on a child's work by naming and comparing the work with previous efforts."

The central importance of personalisation found in the study gives clear support for the maxim of John Goodlad, "Good teaching builds bridges to individuals."

Management

There is also much common ground between the strongly endorsed findings on management and those from other studies of effective practice. The assertion from a study of exemplary science and mathematics teaching which states "Exemplary teachers used management strategies that facilitated sustained student engagement" could be a heading for many of the present study's management maxims, e.g. "Break up long sessions," "Change faltering activities", "Give help quickly", "Minimise the intrusion", "Have back-up activities" Table 1, 1.0).

An illustration of the effect of a routine on class management is provided by an incident in a year 5/6 (standard 4/form 1) class. The routine allowed the class groups to accrue points towards a group prize at the end of the term. The children who won points for their groups usually recorded them on the chalk board. On one occasion, the class was noisy, very slow to put away books and slow to move to the front during a change of lessons. There was immediate silence, however, and quick compliance when the teacher said, "I have a duster and chalk in my hands. I hope I can use them to change your status". This acted as a reminder of a well established and effective routine ("Use incentive systems").

Class climate

A further area where there was strong teacher agreement with the maxims was class climate which included the

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maintenance of positive personal relationships within the classroom between teacher and students and amongst students. This is very clear in the items under 2.1 "Sensitivity to Individuals" (Table 1). The maxim for item 2.1.3, for example, is "Support each child emotionally and avoid causing embarrassment and discomfort".

Even when children needed to be corrected for misbehaviour, the teachers believed it was best to do it in as mild a way as possible in order to preserve a positive classroom affect and to minimise disruption to the forward press of the work. The following incident illustrates this:

> During the spelling pre-test the teacher noticed Emma was looking at her individual list as she wrote the words. The test was being given by her partner. "What are you doing Emma?" the teacher asked. "Cheating," she admitted. "Obviously you'll have to put in a special effort on that list, won't you, Emma?" he chided. Emma, rather embarrassed, smiled in agreement and stopped looking at her list as the pre-test continued.

The teacher knowledge which informed this incident is as follows:

> A low key response is non-threatening to the children. She knew she had done wrong. The teacher, by his questioning, had brought her to admit it. She had sufficient confidence in him and self assurance to acknowledge her own cheating. Hence strong reproof was not necessary. Mild correction was sufficient. Children are developing a sense that they are responsible for their own actions and this low-key approach gives them maximum scope to exercise their own emerging sense of responsibility. In this way it fosters independence.

The maxim educed was, "When correcting a misdemeanour, use a low-key reproof if possible and direct the child's attention to the learning task".

A strong cohesiveness and a minimum of friction was evident in the classrooms of the outstanding teachers in this study. By and large children seemed to enjoy the company of the teacher and they worked together very well.

Some maxims which further illustrate the attention outstanding teachers give to fostering a good classroom tone are: "Develop self-esteem through differentiated work" (Table 1, 3.1.6), "Create a stimulating classroom" (Table 1, 3.2.1) and "Vary (expectations) according to emotional state" (Table 1, 2.2.2).

Teacher disagreement over maxims

A quarter of the maxims which failed to receive strong support from 75 percent of teachers were in the contentious area of *Grade and Class Identity*. This confirmed the researchers' impressions from working with the teachers individually, and as a group, that there are strong differences of opinion over where the fulcrum should be put when attempts are made to balance the need for children to see themselves (and for others to see them) as members of both a grade, and a class which subsumes grades. For example, a maxim which had to do with *reinforcing grade identities* drew very different comments from four teachers:

1. "Never"
2. "I think establishing a class identity is more important"
3. "Very important when interviewing parents"
4. "Also mix with other 3-4-5-6 on excursions so that the composite class doesn't feel isolated."

Value of the maxims

The considerable and often strong disagreement over the validity of some maxims by outstanding teachers raises an important point. There is no right or best way to teach. Good teaching depends on an interaction of teacher personality and style with subject content on the one hand and student characteristics on the other. And it requires the complex regulation of affective as well as cognitive factors on each side of the interchange. What an outstanding teacher does is a response to the unique factors in a particular classroom situation. From such responses we have derived maxims which might be applicable in other situations. The purpose of deriving the maxims is not to provide an instant, off-the-hook response for any teacher but to draw attention to strategies that have been used successfully in composite classes and to invite teachers to consider whether they should incorporate such strategies into their own repertoire of skills. As we have seen, teachers do feel that most of the maxims would be useful.

Quantitative analysis of teachers' responses to the validation exercise showed that there was a high degree of enthusiasm for learning about what happened in other composite classes of other outstanding teachers.

What is special about composite class teachers?

The outstanding composite class teachers showed high levels of skill as revealed by a number of maxims that had particular reference to composite classes. Their expectations of children were realistic and discriminating. They established efficient routines which enabled the many classroom functions to proceed with a minimum of fuss. They used group work skilfully to cater for individual differences. They sometimes taught the same lesson content to the whole class but made different process demands suitable to different individuals and groups. These are indeed advanced level teaching skills but each is also applicable to the regular class.

When the 21 outstanding teachers had finished the validation exercise they were asked if they thought the majority of maxims were applicable to any kind of teaching. They unanimously agreed that they did.

While there is good reason to believe that composite class teaching is not qualitatively different from teaching a single grade, the evidence of this study suggests that effective composite class teaching requires a heightened expression of some of the most demanding skills a teacher develops. Good composite class teaching is different in the degree, not in the kind of skills required.

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Notes

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Full details of the study with an extended discussion of the results, and all the incidents and maxims can be found in

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item 8

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Teaching Can Be Hazardous to Your Health

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TO ENSURE OPTIMAL LEARNING students require healthy, enthusiastic, competent teachers. Teachers who remain on the job when they are ill do themselves and their students a disservice. An overwhelming 88 percent of women teachers in this Queensland study continued to teach despite health conditions that in most other jobs would have kept them at home or required that they go home on sick leave.

The backbone of the classroom

In a primary school the teacher, most commonly a woman, is the essential feature of any classroom. She is totally responsible for the physical, social, emotional and intellectual development of her students for six hours per day.

This research concerns the health problems experienced by North Queensland women primary teachers. Both men and women teachers are prone to a variety of health problems, including stress and burnout, but because 70 percent of all primary school teachers in Queensland are women, it is their work and health that this study attempts to illuminate. The research involved individual and group interviews and a large-scale survey that resulted in 291 useable responses (see notes).

Although occupational health and safety considerations have been included in most industrial and professional awards, in general teaching has not been seen to involve any particular occupational health hazards. This reflects the feminisation of teaching and the notion that teaching is a caring, nurturing profession. It is rarely seen as *work*. But teaching *is* work, and the work teachers do often affects their health and ability to continue working to their maximum ability.

Desks and chairs fight back

Putting up classroom displays can be a health-endangering exercise. According to one teacher:

> You have to put netting and calico up and lots of things for displays. But, because each room isn't given a *ladder*, you've got to improvise – standing on desks or chairs or whatever the case may be.

This teacher injured her back stepping down from a makeshift ladder onto a table which rolled as she was reaching to put up displays.

Forty-one percent of survey respondents reported having been injured on the job from lifting resources, etc., using make-shift tools or ladders, and using broken or damaged furniture and equipment:

> I've hammered my fingers because you've also got to be a carpenter. If things are falling apart in the classroom, we don't have anyone who comes in and fixes them. *We* have to fix it up.

Then there is the problem associated with lifting and carrying equipment:

> I know two teachers who have permanent back damage from lifting disabled kids and lugging heavy furniture and tote boxes and books about.

One teacher suffered a miscarriage following a fall while carrying a class set of books down a flight of stairs. She claimed to know other women who had miscarried from lifting or carrying heavy furniture or resources.

Dangerous playgrounds

Students can be violent and abusive, especially in the playground. Teachers are frequently punched and kicked. They have to be on the lookout for missiles – balls, bats, soft-drink cans, and fists that have the potential for physical as well as psychological damage.

Playground duty for one teacher

> ... is the most stressful part of the working week. I get scared out there... There are hazards from kids hurling things, from trying to break up fist-fights... And with the heat all the tempers rise. Trying to pull them apart you cop a fist or a foot or a mouthful of cheek... I had a coke can thrown at me last week. Put it down to prayer. I pray on the days I'm on duty.

Although sensationalised by media, it is evident there is an increase in school violence, and it is not just between students or groups. The hidden victims are teachers – even at primary school level:

> I get quite frightened since I was cornered by a group of boys. Now there are a few places I refuse to go when I'm on playground duty because of what the kids might do to me. I just don't see what's going on. There is both physical intimidation and sexual harassment, especially when the teacher is small.

Bacterial soup

The classroom is not safe either. Few people realise that the primary classroom is in fact a "bacterial soup". When teachers are stressed and tired they are susceptible to any passing infection or sickness, particularly colds, flu, coughs, head lice, impetigo/school sores, scabies, hepatitis, vomiting "bugs", diarrhoea, conjunctivitis, tonsillitis, glandular fever, measles, mumps, chicken-pox, other childhood diseases, and viruses in general.

Several teachers expressed the opinion that stress played a large part in their contagion but also that "parents no longer keep their children at home when they are sick". Consequently, teachers who are confined to the classroom with them all day and who have close contact with them, "especially with younger children who need additional teacher support" and "close bodily contact", are highly likely to be cross-infected.

One teacher expressed the sentiments of many interviewed: "I get just so low, I usually just get whatever is happening."

In addition to infection, teachers frequently lose their voice – their tool of trade – from laryngitis, throat infections and/or allergic reaction from chalk or other elements in their environment. Dustless chalk has not been available to teachers in this region for many years and short of providing their own whiteboards teachers seem to have no alternatives.

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Integration without support

All teachers interviewed reported increased stress and tension due to the inclusion of special needs students in regular classrooms. None had any special education qualifications or training nor had class sizes reduced to compensate for the additional work demands.

A year one teacher, now suffering anxiety attacks and stress, has a spina bifida child with encephalitis and hearing and sight defects, and a child with an intellectual age of between 2½ and 3 as well as 22 other students. The spina bifida child has to be catheterised in the morning and afternoons by teachers and aides:

> I was quite often in tears on Sunday nights... We're not trained in this medical nursing field but we've had to learn to catheterise this little girl.

For these two children the Education Department awarded their teacher 8½ hours aide time a week. She consulted her doctor for stress, disturbed sleep and anxiety attacks and was prescribed valium. She insisted that her problems were put on record to ensure that "if I ever wanted to take stress leave, some of this health history is already documented". Survey data reveal that a number of teachers use Valium to cope with their stress and tension.

Other problems associated with integration of special needs children identified by teachers include: elevated noise levels, additional daily programmes, behaviour problems, lifting children, toileting and, in particular, coping with the wide range of educational abilities and needs of children in one classroom.

Intensification of teachers' work: at and beyond the chalk-face

Teaching is not a 9 to 5 profession and certainly not 9 to 3 as the general public tends to believe. There is always something extra to do at home. All teachers interviewed reported feeling stressed due to the demands on their time, energy and resources. Unlike teachers in other Australian states, Queensland teachers do not currently have non-contact time to carry out extra duties. All lesson preparation, report writing, parent/guardian interviews, inservice, policy development, and professional development is done in out-of-school time. One teacher identified her greatest health problem as stress and burnout related to "the pressure I'm under to produce policies and curriculum documents for committees I'm on". Pre- and after-school demands inevitably interfere with home life.

One teacher, a mother of 2, estimated she spent 50 hours a week on school work and said that if she wanted to do anything of a personal nature

> ... I can't just say "yes I can do it". I've got to check up in my diary first because every afternoon is taken up with something for school.

This typifies the lot of the majority of classroom teachers in this region.

The call of nature: something *no-one* talks about

Teachers interviewed spoke very specifically of personal physical problems related to basic bodily functions. Many spoke of their "incredible bladders". All discussed problems related to going to the toilet, although interestingly, only one had ever talked about it with colleagues:

> This is something not many [women] teachers talk about. In fact, I've only ever spoken to Sue about periods and what a problem it is and it was only just the other day. I've never ever spoken to anybody about it before... it's not something you bring up at staff meetings!

The way schools are structured appears to be part of the problem as are work conditions, and the nature of teaching itself

> ... you can't go to the toilet when you'd like to because you're responsible for the kids in the class. Anyone who "*has* to go" to the toilet has to go during morning tea or lunch. At our school this is a problem because, equity wise, we have only one toilet for males and one for females. This is with 10 female teachers and 3 male teachers and that's also for the secretaries, and aides who are females and for student teachers, who are mostly female... So there's little chance for many women to use the toilet at morning tea time, anyway.

At one school women have resorted to using the men's toilet. They have rationalised that since there are only 2 of them, they can wait!

Teachers who "just have to go" suffer more stress knowing: "We're responsible for the class.... And if anything happens when we're not in our rooms... I know I'd be in trouble." In this age of litigation, teachers could be sued.

Health problems, both short- and long-term, related to passing an entire day without accessing toilets was cause for much speculation:

> My teaching partner and I would sometimes say how when we got home there would be a dash to the toilet because you hadn't been all day... what that does for your kidneys, I don't know!

Problems are multiplied during menstruation:

> I have a problem with menstruation. You always make sure you wear dark clothes when you've got your periods, either black or dark floral or... you could end up being annoyingly embarrassed. There are times during my period that I make sure I don't sit down and just hope for the best until I get to the toilet.

Being rostered for lunch duty means teachers go without a break sometimes up to 4 or 5 hours:

> That's a long time to go without a break. There aren't too many jobs where you can't go to the toilet when you have to. Teaching is probably the only one.

Pregnancy makes the problem worse and gynaecological problems also make the situation critical for some teachers. But

> going to the toilet is never talked about. It's embarrassing... but it's a very significant problem. Principals have no understanding. If they did they wouldn't timetable you for duty without at least time for a toilet stop or timetable a pregnant teacher to do double [period] exam supervision.

Doctors attribute many teachers' urinary tract infections, prolapsed uterus, thrush, dehydration, diarrhoea, and constipation to insufficient fluid intake and limited access to toilets.

Teachers' solutions: please minister!

Teachers identified the need for showers, and more toilet facilities, preferably attached to each classroom, regular relief time, and morning and lunch breaks without duty so that they can "answer nature's call" and recoup their energy for continued quality teaching. They argued a case for employing community members to do playground supervision and for *clean, private* toilet facilities with quality paper – in some instances, for paper of any kind – hygienic disposal facilities, and clean towels or electric hand dryers.

School locations: environmental problems

Queensland's sun and heat compound teachers' health problems. Classrooms are not, in most instances, designed for north Queensland summer conditions nor equipped with air-conditioning. A teacher who teaches in a demountable (a transportable classroom shifted on to a site as a temporary measure to provide teaching space in the interim) claimed that it had been "forty degrees in our room already this term and in summer it would average about thirty-five in the afternoons. We can't teach under those conditions."

Because of extreme heat, many teachers do not teach after the lunch break but allow children to rest under available fans, go to the library, or do other cool activities. Many teachers take their own fans to school to make classroom conditions more bearable. All argued for air-conditioning or at least buildings with adequate ventilation and cooling systems, as well as cold-water fountains in every classroom. These are not luxuries, but basic needs for the climatic conditions in this region.

The location of schools can also cause health problems for teachers and students. One school located close to a cement works has an alarmingly high incidence of asthma, bronchitis, other respiratory diseases and allergies among its clientele. One teacher reported teaching in a school located near an industrial area where "in the mornings there was often a grey lingering fog". Another expressed concern at being exposed to electromagnetic radiation from high voltage electricity cables. She recognised that cause/effect relationships may be hard to prove, as in the other examples of pollution, but nonetheless felt that schools should be sited well away from possible health hazards.

A group of teachers located at a number of different schools expressed their alarm at exposure to fibre-glass particles and asbestos as public works' employees systematically moved into schools to remove these materials from ceilings and walls. At one school the men came in wearing their "big white space-suits" while the teacher and students were still in the other end of the room:

> I said, "Excuse me, but why are you wearing that gear?" They told me it was to protect them from the asbestos and fibres. I was so angry, I told them to leave and wait until I got the children out of the room with all their stuff.

It was worrying to this group, who informed parents and endeavoured to instigate their action or protest, that most parents did not seem to share their concern but rather, were more interested in ensuring their children stayed in school and continued their education. Whether there will be repercussions as a result of exposure to these environmental hazards is unlikely to be known for years to come. Teachers are worried about how the effects might manifest in their health and bodies and if their life-span might be reduced.

The sick teacher – bureaucratic guilt-tripping

Teachers' comments on what happens when they get sick are significant. Many teachers feel guilty if they take time off and rarely take the time recommended by doctors. Four reasons were commonly given for going back to work early or for continuing to teach when sick.

- ☐ Concern for students and the guilt associated with interrupting learning.
- ☐ The guilt associated with loading colleagues with additional duties or responsibilities.
- ☐ The effort involved in preparing a programme for the relief teacher.
- ☐ The knowledge that sick days are limited and that once used must be taken without pay.

Teachers commonly spoke of the pressure put on them to be *very ill* before taking a sick day – many had to phone in sick by 7.30 am, and in some cases, the day before. It is not surprising, given these pressures, that many teachers choose to teach when they are ill, regardless of their health condition. They just keep going, making what compromises they can:

> I think they rely on the fact that the majority of teachers are women and they feel responsible for their kids and guilty if they are imposing on colleagues.
>
> When I go to work and I'm sick, usually someone will swap playground duty with you. You don't get out of doing it, it's just postponed. I find the women at school very supportive...

One teacher spoke vehemently against teaching when unwell and refuses to do so. However, it was not until coming close to death that she made this decision. She now advocates strongly for teachers' right to the entitlements other public servants take for granted. She maintains that teachers' wellbeing should be principals' responsibility. Others argued that principals are bound by departmental restrictions, their schools' budgets and time constraints. So while principals might sympathise, without financial and human resources, most are powerless to act in teachers' best interests:

> As far as the department is concerned, we are mothers in the classroom. Mothers work when they're sick and therefore, so should we.

I love teaching

Despite the stress, health hazards, enormous demands on time, energy and personal resources, and juggling school and domestic work, *all* teachers, without exception, expressed a love of teaching. The passion that many feel is evident:

> I just love teaching... I feel like I'm touching them – the children – in some way. I see them grow and develop and mature. I like to see them happy with themselves because they have accomplished something.

This is typical of teachers' talk about their jobs.

However, some teachers are disillusioned with teaching. One woman with 19 years experience and 18 years of *loving her career* said:

> I always loved it, but teaching for me isn't enjoyable at the moment. I feel kids have changed, the departmental structure has changed.

Culture of silence

A common reason for feeling disillusioned was related to the intensification of their work. From my research, I get the impression that there is a whole hidden women's culture – a culture of silence – among women primary teachers which revolves around health, the manipulation of sick days and teaching while sick or under medication.

Teachers indicated they were reluctant to talk to others about their health and their use of sick days.

> You feel threatened if you reveal how you use your sick days as others may judge them or think your actions are not justified.

Another said she was

> ... reluctant to admit that I am not well or on medication *and* at "that time of the month" often means battling on. Perhaps I don't want to be seen as not coping?

For others the culture of silence was related to their commitments to the school, their genuine concern for students' education and the culture of administration.

> Women are made to feel they have to be dying before they can take sick days because of male dominated admin. putting

stress on teachers to be there at school so money isn't spent replacing you.

However, most comments made in regard to the culture of silence concerned using sick days for sick children. The following examples illustrate the magnitude of the problem and draws attention to the need for structures to be put in place for the care of sick family members and their carers – women teachers.

- Mothers use their sick leave to care for family members who are sick and then work when they are sick themselves.
- We put our families and class before ourselves.
- I think many teachers, male and female, tend to use sick days for many things related to stress or child care rather than actually being sick.
- Women save their sick days for when their own children are ill.

That there is no obvious solution is highlighted in this teacher's comments:

> Some teachers are forced to mask the real nature of their reasons for taking time off and this is deemed unacceptable. I personally can see no way to solve the problem.

The other issue is that since these problems are part of the culture of silence, women are unaware that others share similar problems and dilemmas and have developed strategies for coping that could assist other women teachers. It is time to make public the politics of teachers' health problems and the issues surrounding sick family members. It is time for teachers to start talking to each other and for administration and bureaucrats to start listening.

Survival strategies

Long term effects of remaining on the job whilst ill are yet to be determined. Teachers tend to find ways to cope when they are sick and work hard to minimise infection from students and between students. For example: taking cushions, towels and loose covers home to launder is an additional job several teachers do to reduce cross-infection in the classroom.

Supplying students with tissues, hygiene education and frequent hand washing are strategies mentioned by teachers trying to eliminate health risks. When children are injured, teachers are encouraged to always wear surgical gloves, but

> I can assure you that when a child's bleeding, you don't run to the cupboard to get a pair of gloves! If it's something like changing a bandaid then I wear gloves. It's a good idea to be careful since AIDS.

Trying to manipulate the demands of work, family and domestic responsibilities represents real challenges for women teachers. Strategies that enable them to cope with the demands of their occupation, family and domestic work include: working specific hours at school, for example, between 6.30/7.00 a.m. and 5.00 p.m. and taking school-related work home only when absolutely necessary (report-writing appears to always necessitate taking work home for most teachers), keeping home and school work completely separate, colleague/friend/spouse support, regular gymnasium work-outs, paid domestic help, take-away meals, medication (anti-depressants, valium, sleeping tablets, cold tablets, headache medication, etc.), food, chocolate, coffee, alcohol, gardening, hobbies, exercise, and "veg-ing out".

Teaching is one of the most stressful occupations. The testimony of women teachers suggests that "stress" and "burnout" have far more complex dimensions than research has documented. The gendered labour of primary school teaching – the predominance of women and the nurturing/caring nature of primary school today – makes the politics of health for women teachers a primary issue. Importantly, it is also a pedagogical concern of national importance. Women who teach while sick, or sick children who are sent to school, make for unhealthy classrooms and poor teaching/learning encounters. Students need healthy teachers who are also content in their work and work place.

Notes

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This paper represents part of a larger PhD research project in which women teaching in the Northern Region of the Queensland Department of Education were surveyed. The 20 page questionnaire was distributed by the Queensland Teachers' Union following a long, unsuccessful process to elicit the co-operation of the Queensland Education Department. The return rate of the survey was 37 percent (291) of 787 to whom it was mailed – a fair return given that the mailing was done just three weeks prior the end of the school year when teachers were involved in report writing and other end-of-year activities and responsibilities.

Twenty interviews have been conducted, transcribed and analysed for themes. Ten more are still to be transcribed and analysed. Interviews loosely followed a schedule and transcripts were returned to teachers for verification and editing. Requests from teachers to expunge or modify excerpts from transcripts have been respected. The research, employing a multidisciplinary methodology, is situated within two theoretical frameworks, the sociology of work and feminist post-structural theory.

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Re-Placing the Arts in Education

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Shona McLean

Re-Placing the Arts in Education

Wendy Geoghegan

I KNEW IMMEDIATELY that something was wrong when the students whom I was addressing – using the art form of storytelling – expected me to be costumed as a Ninja Turtle. When I tried to conduct a movement exercise based on my story, I was greeted with vacant stares and young bodies seemingly glued to their chairs. Had the mass media taken such complete control of these children's awareness of art forms?

The arts are the "minority" subjects in American education, and they suffer all the indignities of the downtrodden – low status, neglect, poverty, and powerlessness. They deserve better.

Our children deserve better too. I knew that the lack of arts education in the lives of the children in that school had inhibited their ability to communicate ideas spontaneously, to respond with feeling, and to discern quality from commercial junk. If introduced early and incorporated regularly into instruction, the arts can teach us about our capacity to communicate ideas and feelings in a variety of modes and media. Scholars from John Dewey to Susanne Langer have stressed the importance of the aesthetic experience and claimed for art the ability to educate the imagination, improve the sensibilities, increase awareness, and provide peak experiences. Whether through drama, dance, music, or visual arts, art educators have the capacity and the responsibility to work toward a cross-disciplinary approach that will help ensure that every child in every school feels the tingle of truthful engagement that a holistic approach to education can bring.

In the biological sense, a culture is a place for growing things. Schools themselves must be examined as cultures. They are cultures for growing minds, bodies, and spirits, and the direction this growth takes is influenced by the opportunities the school provides. Do we want flowering plants, or are we content with spindly branches? If we truly believe that our young plants can burst forth in flower, then we need to pay attention to the ingredients we are using to mulch the soil. Like a good recipe for anything, a portion of this and a portion of that is what makes the result rewarding. Currently, we seem to have lots of this (academic and technological instruction) and very little of that (arts education).

Traditionally, imagination has been regarded as the antithesis of reason. My own experience as an arts educator at the elementary and college levels provided me with one way of applying fresh paint to highlight the role of the arts in enhancing individual, classroom, and community co-operation and learning. We educators need to stop believing that trying something new will be feasible only in someone else's classroom, in another school, in another place, with another group of students, and so on. Addressing the arts and their importance to education may seem like an enormous task, but it is one that we must face. Students, parents, and the communities that we serve deserve the chance to see new approaches tried and older approaches revived. There is no place for expiration dates in our work.

Certainly teachers must face the pressing problems that beset young people. Family fragmentation; new extended families; social, racial, and religious isolation; violence and abuse; low academic achievement; poor self-esteem; and the loss of a sense of community have cast shadows across the future of our young people. An African proverb states that it takes "the whole village" to rear a child. With this in mind, I want to describe a learning experience based on work done with four groups of elementary students – the same ones who so passively waited for the Ninja Turtle to entertain them.

Each group consisted of approximately 15 youngsters between the ages of 9 and 11. Because drama is the art form with which I am most experienced, the core of the work focused on the careful building of selected characters through role playing.

To start with, the students used the library to research various native American tribes, tracking their geographical locations and learning about the various housing methods, common beliefs, division of labour, and the interdependence necessary for individual and group survival. The children drew maps showing major water sources, mountains or plains, and village locations. They identified the clothing and symbols used by different tribes.

Once the children were satisfied with their accumulated research and had shared it with their classmates, we set about creating our own tribe in the classroom. The process of making decisions was paramount at this point. After much questioning and discussion, the children used their prior work with maps to decide collectively where their tribe would be located. We used their list of possible jobs to allow the children to choose tasks that they could comfortably imagine themselves doing.

> "...Do we want flowering plants, or are we content with spindly branches?"

Community spirit began to build as the children fashioned tunics for their tribal partners, knowing that the painted designs on the tunics would be their own creations, based on the tribal icon they had agreed on. We listened to a variety of selections of music so that we could choose a particular piece to play throughout the painting of the tunics. The freedom and sense of purpose that each child displayed in designing tunics were remarkable. The only restriction on their efforts was that, within their design, they had to incorporate a symbol that represented the job that their partner had chosen. When the tunics were completed, each child told the tribe why he or she had selected a particular symbol and explained how it was meaningful for the chosen job. This exchange took place in the tribal circle.

Once each student had chosen a role within the tribe, we held a tribal meeting. As we sat around the community fire at the end of a long day's work (the children had created tableaux depicting the day's events using dance, chanting, and musical instruments made in class), the conversation was so rapid that one student suggested the possibility of using a tribal speaking stick so that everyone could have a chance to be heard.

I seized on this opportunity to take a nature walk in the hope of discovering the kind of stick the children had in mind. We took along a library book that identified various trees, so that, when we found fallen branches, we could figure out what kind of trees they had come from. As we considered each possibility, we gathered in a circle while a volunteer read the information aloud. All the sticks we found were brought back to the classroom, and a meeting was held to choose our speaking stick. Using information from the tree book, the children argued for particular trees. (Oaks and maples were the favourites.) Discussion concerned the properties of each tree and the metaphorical implication to the tribe. Finally, a stick from an oak tree was chosen.

I then had each child use tempera paint to incorporate his or her job symbol on the stick, and we finished by gluing on feathers that the students had found in their backyards or in a local park. This activity led them to inquire about the types of birds that the feathers had come from. Once again, we returned to the library. This time, the subject of our investigations was ornithology.

There was no question after such intense efforts that the tribe "owned" that stick. It was theirs, and they used it with the kind of respect for its integrity with which any worker would regard the tools of his or her trade.

The use of drama happened just as spontaneously. The arts enable all children, regardless of their differences, to participate fully in the process of education. Around our tribal fire, the children created a legend explaining how the tribe had come into being. Each child added a sentence to the story, and every child's sentence was included both on the blackboard and in paper copies that served as proof of their tribal participation. After the legend was created, one student (her chosen role was that of a hunter) mentioned having sighted a stranger while out searching for food for the tribe. Tension rose within the group. They were undecided as to what to do with the stranger. Was the stranger an enemy or a friend? How would they decide? What criteria would they use? Do we invite the stranger in? Exclude the stranger? Does the perceived physical difference (as told by the child in role) make the stranger a threat? A lively discussion ensued, in which the speaking stick played an essential role.

The theme of "tribe" is a powerful one for building a co-operative learning environment. Historically, if you trace back far enough into every person's ancestry, you'll find a tribe. We define the word *tribe* as a community, extended family, or any group of people with shared values, experiences, and identity. Because the theme of "tribe" satisfies a powerful human need for connectedness, belonging, and trust, it allowed us to create a socially inclusive learning environment. The tribal theme ties together history, science and technology, social studies, language, and physical and social development, putting the entire curriculum into a real-life context. The children had framed and formed knowledge to such a degree that it became understandable to them. They had worked from a context that they knew within themselves.

That drama lesson gave me valuable insights into each of the children. Every statement made by every child was a compass to an inner core, a guide to a place from which he or she came. It was an exhilarating beginning for all of us to realise the importance of community problem solving. We need to know how to communicate with every child in our classrooms, and we cannot teach them well unless we know them. Students willingly participate when their input has a chance of being acknowledged. Teachers need to let them know that what they have to contribute is important.

The children knew their value within the tribal community. At the same time, they learned to listen to and respect the opinions and values of others. Later discussions focused on how the decision-making process in the tribal theme unit could be applied to the broader community.

The children examined how their individual and collective contributions to tribal deliberations had played a role in changing outcomes. We created a list of learning areas that they engaged in during the project. Their list read as follows: painting, designing and making costumes, music, dancing, writing, role playing, chanting, speaking, questioning, reading, researching, investigating, examining, storytelling, and sharing. These children came to realise that they didn't have to be especially talented in a particular area in order to be fully engaged and to contribute. Richard Lewis has stated that, if we want to know what a flower is, we must experience it on a multitude of levels, from the empirical (smell and taste and touch and hearing) to the imaginative (personifying and fantasising). All of these levels can co-exist, and one is no more important than the other.

"... they didn't have to be especially talented in a particular area in order to be fully engaged and to contribute"

Using the arts to expand awareness and create new environments is unlike the traditional classroom approach, in which only the intellectual proclivities of students are elicited and recognised. The students involved in the tribal project had diverse intellectual capacities and cultural backgrounds, but they came together as a group. Children not only need to know isolated facts, but they also need to see bridges between the disciplines. They need to discover how ideas are connected. Without an understanding of larger patterns, we prepare our students not for wisdom but for a game of Trivial Pursuit. Indeed, the creation of a tribe through the art form of drama enabled students to experience a wide range of arts and a wide range of academic disciplines. The children had the chance to communicate their opinions and the new knowledge they were discovering.

Children such as those in this tribal project are our future. We must teach them well and let them lead the way. An academic, aesthetic, creative, and social learning environment is one way to equip our students for the challenges they will face in the complex cultural mosaic that will be their future. The challenge to us, then, is to avoid thinking about our teaching too narrowly and instead to use the broader focus that the arts encompass. Life and learning are artistic endeavours for all children. For me, these students exemplified the truth of that claim. They moved beyond the crass commercialisation of expecting to be entertained by a Ninja Turtle and realised that they could create an understanding of how the arts relate to human feeling, intuition, and creativity. The experience of art as a "language", a means of communicating a message about their tribe, opened doors for them to stored wisdom and new knowledge.

The arts, properly taught, are basic to individual development since they, more than any other subject, awaken all the senses – the pores of learning. I believe that we art educators must make our voices heard. Arts education must be seen as more than entertainment, a hobby, or an after-school pursuit. Let us continue to give voice to the language of arts education. Let us allow our children's voices to be heard in our classrooms as clearly and joyously when they are learning as when they are engaged in the hard work of play.

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item 10

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Wonderland Beyond the
BLACK HOLE

Michio Kaku
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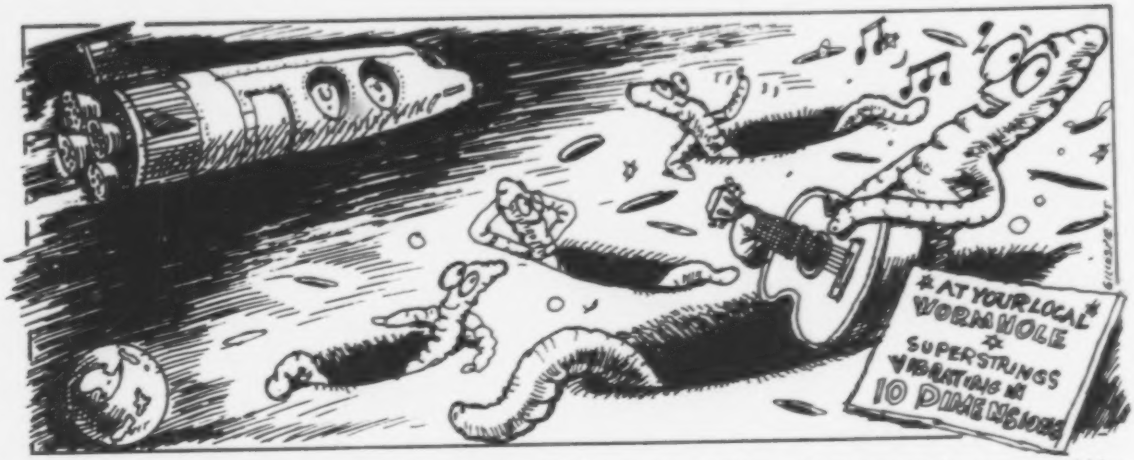

LAST JUNE astronomers were toasting each other with champagne in laboratories around the world, celebrating their latest discovery. The repaired $2 billion Hubble Space Telescope, once the laughing stock of the scientific community, had snared its most elusive prize: a black hole.

But the discovery of the Holy Grail of astrophysics may also rekindle a long simmering debate within the physics community. What lies on the other side of a black hole? If someone foolishly fell into a black hole, would they be crushed by its immense gravity, as most physicists believe, or would they be propelled into a parallel universe or emerge in another time era?

To answer this complex question, physicists are opening up one of the most bizarre and tantalising chapters in modern physics. They have to navigate a minefield of potentially explosive theories, such as the possibility of "wormholes", "white holes", time machines, and even the tenth dimension!

This controversy may well validate J.B.S. Haldane's wry observation that the universe is "not only queerer than we suppose, it is queerer than we can suppose".

This delicious controversy delights theoretical physicists but boggles the mind of mere mortals. A black hole, simply put, is a massive, dead star whose gravity is so intense than even light cannot escape, hence its name. By definition, it cannot be seen, so Nasa scientists focused instead on the tiny core of the galaxy M87, a super massive "cosmic engine" 50 million light years from earth.

Astronomers then showed that the core of M87 consisted of a ferocious, swirling, maelstrom of superhot hydrogen gas spinning at 1.2 million miles per hour. To keep this spinning disk of gas from flying apart violently in all directions, there had to be a colossal mass concentrated at its centre, weighing as much as two billion to three billion suns. An object with that staggering mass would be massive enough to prevent light from escaping. Ergo, a black hole.

But this also revives an ongoing controversy surrounding black holes. The best description of a spinning black hole was given in 1963 by the New Zealand mathematician Roy Kerr, using Einstein's equations of gravity. But there is a quirky feature to his solution. It predicts that if one fell into a black hole, one might be sucked down a tunnel (called the "Einstein-Rosen bridge") and shot out a "white hole" in a parallel universe.

Kerr showed that a spinning black hole would collapse not into a point, but to a "ring of fire". Because the ring was spinning rapidly, centrifugal forces would keep it from collapsing. Remarkably, a space probe fired directly through the ring would not be crushed into oblivion, but might actually emerge unscratched on the other side of the Einstein-Rosen bridge, in a parallel universe. This "wormhole" may connect two parallel universes, or even distant parts of the same universe.

The simplest way to visualise a Kerr wormhole is to think of Alice's Looking Glass. Anyone walking through the Looking Glass would be transported instantly into Wonderland, a world where animals talked in riddles and common sense was not so common.

The rim of the Looking Glass corresponds to the Kerr ring. Anyone walking through the Kerr ring might be transported to the other side of the universe or even the past. Like Siamese twins joined at the hip, we now have two universes joined via the Looking Glass.

Some physicists have wondered whether black holes or wormholes might someday be used as shortcuts to another sector of our universe, or even as a time machine to the distant past (making possible the swash-buckling exploits in *Star Wars*). However, we caution that there are sceptics

The critics concede that hundreds of wormhole solutions have now been found to Einstein's equations, and hence they cannot be lightly dismissed as the ravings of crackpots. But they point out that wormholes might be unstable, or that intense radiation and sub-atomic forces surrounding the entrance to the wormhole would kill anyone who dared to enter.

Spirited debates concerning these wormholes have erupted between physicists. Unfortunately, this controversy cannot be resolved, because Einstein's equations break down at the centre of black holes or wormholes, where radiation and sub-atomic forces might be ferocious enough to collapse the entrance. The problem is that Einstein's theory works only for gravity, not the quantum forces which govern radiation and sub-atomic particles. What is needed is a theory which embraces both the quantum theory of radiation and gravity simultaneously. In a word, to solve the problem of quantum black holes, we need a "theory of everything!"

One of the crowning achievements of 20th-century science is that all the laws of physics, at a fundamental level, can be summarised by just two formalisms: first, Einstein's theory of gravity, which gives us a cosmic description of the very large, i.e. galaxies, black holes and the Big Bang. Second, the quantum theory, which gives us a microscopic description of the very small, i.e. the microcosm of sub-atomic particles and radiation.

But the supreme irony, and surely one of nature's cosmic jokes, is that they look bewilderingly different; even the world's greatest physicists, including Einstein and Heisenberg, have failed to unify them. The two theories use different mathematics and different physical principles to describe the universe in their respective domains, the cosmic and the microscopic.

Fortunately, we now have a candidate for this theory. (In fact, it is the only candidate. Scores of rival proposals have all been shown to be inconsistent.) It's called "Superstring theory", and almost effortlessly unites gravity with a theory of radiation, which is required to solve the problem of quantum wormholes.

The superstring theory can explain the mysterious quantum laws of sub-atomic physics by postulating that sub-atomic particles are really just resonances or vibrations of a tiny string. The vibrations of a violin string correspond to musical notes; likewise the vibrations of a superstring correspond to the particles found in nature. The universe is then a symphony of vibrating strings.

An added bonus is that, as a string moves in time, it warps the fabric of space around it, producing black holes, wormholes, and other exotic solutions of Einstein's equations. Thus, in one stroke, the superstring theory unites both the theory of Einstein and quantum physics into one coherent, compelling picture.

The curious feature of superstrings, however, is that they can only vibrate in ten dimensions. This is, in fact, one of the reasons why they can unify the known forces of the universe: in ten dimensions there is "more room" to accommodate both Einstein's theory of gravity as well a sub-atomic physics. In some sense, previous attempts at unifying the forces of nature failed because a standard four dimensional theory is "too small" to jam all the forces into one mathematical framework.

To visualise higher dimensions, consider a Japanese tea garden, where carp spend their entire lives swimming on the bottom of a shallow pond. The carp are only vaguely aware of a world beyond the surface. To a carp "scientist", the universe only consists of two dimensions, length and width. There is no such thing as "height". In fact, they are incapable of imagining a third dimension beyond the pond. The word "up" has no meaning for them. (Imagine their distress if they were to be suddenly lifted out of their two dimensional universe into "hyperspace", i.e. our world.)

However, if it rains, then the surface of their pond becomes rippled. Although the third dimension is beyond their comprehension, they can clearly see the waves travelling on the pond's surface. Likewise, although we earthlings cannot "see" these higher dimensions, we can see their ripples when they vibrate. According to this theory, "light" is nothing but vibrations rippling along the fifth dimension. By adding higher dimensions, we can easily accommodate more and more forces, including the nuclear forces. In a nutshell: the more dimensions we have, the more forces we can accommodate.

One persistent criticism of this theory, however, is that we do not see these higher dimensions in the laboratory. At present, every event in the universe, from the tiniest sub-atomic decay to exploding galaxies, can be described by four numbers (length, width, depth, and time), not ten numbers. To answer this criticism, many physicists believe (but cannot yet prove) that the universe at the instant of the Big Bang was in fact fully ten dimensional. Only after the instance of creation did six of the ten dimensions "curl up" into a ball too tiny to observe. In a real sense, this theory is really a theory of creation, when the full power of ten-dimensional space-time was manifest.

Not surprisingly, the mathematics of the tenth dimensional superstring is breathtakingly beautiful as well as brutally complex, and has sent shock waves through the mathematics community.

Entirely new areas of mathematics have been opened up by this theory. Unfortunately, at present no one is smart enough to solve the problem of a quantum black hole. As Edward Witten of the Institute for Advanced Study at Princeton has claimed: "String theory is 21st-century physics that fell accidentally into the 20th century." However, 21st-century mathematics necessary to solve quantum black holes has not yet been discovered.

But the stakes are so high, that this lack has not stopped teams of enterprising physicists from trying to solve superstring theory. Already, more than 5 000 papers have been written on the subject. As Nobel laureate Steve Weinberg said, "How can anyone expect that many of the brightest young theorists would not work on it?"

Progress has been slow but steady. Last year, a significant breakthrough was announced. Several groups of physicists independently announced that string theory can completely solve the problem of a quantum black hole. (However, the calculation was so fiendishly difficulty it could only be performed in two, not ten, dimensions).

So that is where we stand today. Many physicists now feel that it is only a matter of time before some enterprising physicist completely cracks this ticklish problem. The equations, although difficult, are well-defined. So until then, it is still a bit premature to buy tickets to the nearest wormhole to visit the next galaxy or hunt dinosaurs.

Notes

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item 11

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Measuring Print Exposure

IN NEW ZEALAND CLASSROOMS

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RESEARCHERS AND TEACHERS both overseas and in New Zealand are all but unanimous that children should be encouraged to read during and outside school hours. It would appear that New Zealand primary and intermediate teachers are making every attempt to encourage children to read at school. Most New Zealand primary and intermediate classrooms place an emphasis on exposing children to print.

In middle and upper primary school classrooms, 87 percent have regular independent reading (often referred to as Sustained Silent Reading, or SSR) between 10 and 30 minutes each day. Also, teachers have regular reading programmes (four times a week or daily) and 87 percent read to their class regularly.

There is a strong belief that children learn to read by reading. According to Trevor Cairney, an Australian researcher:

> The most important element in any reading programme is the provision for children to read constantly. In fact, some reading educators claim that reading instruction need not involve anything else.

Not only will children learn to read through print exposure, it provides the opportunity to practise reading skills. As Jackson puts it, "If they don't read much, how they ever gonna get good?"

But are children actually reading? Studies have shown there are large individual differences in the amount of at-school and at-home reading. The number of words read in one first grade (6 year old) sample ranged, during one week, from a low of 16 to a high of 1 933 words. In the middle grades (ages 10-12 years) there was an estimated difference of 900 000 words between the less motivated, and the average middle grade readers, in the number of words read during a year. What's more, the keenest middle grade reader read an additional 49 000 000 words.

Not only are there large individual differences in the amount of at-school reading, there are also significant individual differences in the amount of at-home reading. One study found that most 10 year old children read only a few minutes per day (median = 4.6 minutes), while a few children read a great deal more. Television viewing occupied, on average, 111 minutes each day.

Does it really matter that a significant number of children aren't reading all that much? There are strong theoretical reasons to expect a positive effect from print exposure. Research has shown that vocabulary growth occurs primarily through reading rather than through direct instruction. Because of the enormous volume of vocabulary encountered while reading, children must develop ways of increasing vocabularies on their own. The vocabulary size for 5 and 6 year olds ranges between 2 500 and 5 000 words. And the rate of vocabulary growth occurs at approximately 3 000 words a year, or 7 new words each day. So by the time children leave school, their vocabulary is estimated to be 41 000 words. It is unlikely that an increase of seven words each day could occur through direct instruction. There are just too many words to teach. So growth in vocabulary must come from other means. Research suggests that exposure to print, rather than oral language, is the main contributor to vocabulary growth.

Why is this so? An analysis of the type of words used in printed texts, television texts and adult speech showed how lexically impoverished speech is compared with newspapers, books and popular magazines. The words used in the three different contexts were ranked according to the frequency in which they occur. For example, the word "it" is ranked 10th and the word "shrimp" is ranked 9 000th. A rare word is one that has a rank lower than 10 000. These words are normally outside the vocabulary of 10-12 years olds. The number of rare words per 1000 words in children's books is 30.9 as compared with 17.3 rare words per 1000 for college graduates talking to friends. Even the words in children's books are rarer than the words on prime-time adult television (22.7 rare words per 1000). What this analysis demonstrates is that if vocabularies are going to grow, children must be exposed to rare words. And rare words are rare in adult speech, popular prime-time children and adult television shows.

There is also evidence to support the claim that increased print exposure leads to growth in children's reading comprehension. Researchers using a daily-diary method have found that print exposure had a positive effect on reading comprehension.

The numerous studies which have focused on measuring print exposure have used a variety of approaches to measure reading habits. One method is by questionnaires. Here children or adults are asked to estimate the amount of time they spend reading. Research, however, has found this method to be unreliable. Because young children have difficulty gauging periods of time their responses are not reliable. And it is possible that older children and adults may give socially desirable responses. That is, they may say they read more than they actually do.

Another less common method of assessing print is the diary method. The daily-diary method and reading logs provide an accurate account of time spent reading, but are time consuming for both the subject and researcher.

While the daily-diary method for assessing print exposure is an absolute measure, the third method for assessing print exposure is a proxy measure of reading activity designed by Cunningham and Stanovich, 1990. The Title Recognition Test (TRT) was designed to avoid subjects giving socially desirable answers. In the TRT subjects placed a tick next to the book titles they are familiar with. To prevent the subject from ticking all the titles, foils were dispersed among the actual titles.

In this way, guessing did not advantage the subject because it was easily detected and then corrected by subtracting the percentage of foils ticked from the percentage of correct responses ticked.

The advantages of the TRT include (a) low cognitive load, (b) minimal subjective judgments, and (c) objective assessment of response bias. The TRT is also quick and easy to administer and is a reliable, predictive measure.

The purpose of this study was to design and test a quick and accurate method of assessing print exposure with 8, 9 and 10 year old New Zealand children based on the TRT, using story titles they would be familiar with.

Developing the TRT

There were 126 participants (58 girls and 68 boys aged 8-11 years from six classrooms in a middle class school in a provincial city) in the study.

Scores were available from classroom teachers for the Progressive Achievement Test – Reading Comprehension – Revised. Based on PAT reading comprehension scores, children in each year were divided into two equal groups. One group being above-average comprehenders and one group being below-average comprehenders.

Six TRTs were trialled over eight weeks (3 trials for standard 2 or year 3 and 3 trials for standard 3 and 4 or year 4 and 5). For each trial the actual titles were interspersed with the foils. Titles selected for the 6 trials was done in consultation with a lecturer in children's literature, a representative from Ashton Scholastic, a children's librarian at the public library, and a university librarian who had a particular interest in children's literature. Children from the trial school as well as standard 3 and 4 children from a neighbouring school also wrote down titles of books they had read in the past six months. All attempts were made to ensure that titles represented the reading preference of both boys and girls as well as the age group.

Thirty-seven titles and 15 foils comprised the third and final trial. Titles which had a reasonably high recognition rate which also showed a difference between good and poor readers were used in the final analysis. From the final trial, 25 titles and 14 foils were selected for the 2 TRTs.

Results and discussion

List 1 was given to standard 2 children and List 2 was given to standard 3 and 4 children. The method used for scoring the TRT was taking the percent of actual titles ticked and subtracting the percent of foils ticked. Subjects would score 100% if they ticked all 25 titles but didn't tick a foil (100% – 0 = 100%). And subjects would score 0 if they ticked all the titles and foils (100% – 100% = 0). This method of subtracting foil scores is a useful way to correct for guessing.

As can be seen in Table 1, the mean proportion of correct titles identified for the total sample of standard 2 (List 1) was 46% and the mean proportion of foils ticked was 12%, giving a corrected score of 34%. The mean proportion of correct titles identified for above-average standard 2 readers (n=24) was 59%, and the mean proportion of foils ticked was 4%, giving a corrected score of 55%. The mean proportion of correct titles identified for below-average standard 2 readers was 33% and the mean proportion of foils ticked was 20%, giving a corrected score of 13%. Table 5 shows the differences between above-average and below-average readers for individual titles on List 1 of the TRT. These results support the overall results, showing that above-average groups recognised more titles, and ticked fewer foils.

Table 1

Title and Foil Mean Proportion Recognition Rate

Standard 2 – List 1

Subjects	Recognition rate %	Foil rate %	Corrected score %
Standard 2			
Total Sample (N=48)	46	12	34
Above-average Readers (N=24)	59	4	55
Below-average Readers (N=24)	33	20	13

The results of the final trial for List 2 of the TRT which was given to standard 3 and 4 can be found in Table 2. They also support the overall results, showing that above-average groups recognised more titles, and checked fewer foils. Table 6 shows differences between above-average and below-average groups for individual titles on the TRT. These results support the overall results, showing the above-average groups recognised more titles and checked fewer foils than did the below-average groups.

Table 2

Title and Foil Mean Proportion Recognition Rate

Standard 3 and 4 – List 2

Subjects	Recognition rate %	Foil rate %	Corrected score %
Standard 3			
Total Sample (N=40)	39	13	26
Above-average Readers (N=20)	49	6	43
Below-average Readers (N=20)	29	19	10
Standard 4			
Total Sample (N=38)	47	17	30
Above-average Readers (N=19)	64	10	54
Below-average Readers (N=19)	30	24	6

The results show that above-average readers were able to recognise more titles than the below-average readers and that they also had a low false alarm rate. That is, they ticked fewer foils. For example, one above-average standard 2 reader ticked 22 out of 25 possible titles, and no foils. The corrected score for this reader was 88% (88% – 0% = 88%).

The below-average readers tended to have a higher false alarm rate (ticked more foils). For example one below-average standard 2 reader ticked 16 out of 25 possible titles an

5 of the 14 foils. Their corrected score (proportion of titles ticked minus proportion of foils ticked) was 29% (64% − 35% = 29%). This performance was common amongst below-average readers suggesting that they were sometimes just guessing. It was also possible that below-average readers were confused about what to do. However, the children in this study had completed a different version of the TRT before, and instructions were explicit. Also, as mentioned earlier, one of the advantages of the TRT is that it has a low cognitive load, so confusion seemed unlikely.

An example

To further illustrate how to score the TRT test, imagine that a pupil ticked 15 out of the 25 real titles on the list. This would give a recognition rate of 60% (i.e., 15/25 x 100 = 60%). If the same pupil also mistakenly ticked 1 of the 14 foils, which are not real titles, then this would give a false alarm rate of 7% (i.e., 1/14 x 100 = 7%). The corrected recognition rate would then be 53% (i.e., 60% − 7% = 53%). If the pupil was in standard 2, a check of the average scores in Table 1 would suggest that this pupil is in the above-average range (the mean score in Table 1 is 34% for the total standard 2 sample, and 55% for the above-average readers in that sample).

To summarise, the results of this TRT survey show that good readers appear to have a much higher print exposure than poor readers, since they are more knowledgeable about books.

Validity checks

Table 3 gives the correlation coefficient of Lists 1 and 2 of the TRT with PAT reading comprehension. The correlation for all grade levels was quite high. What this meant was that those who scored above-average in PAT reading comprehension tended to score higher on TRT, while those scoring below-average on PAT reading comprehension also tended to score lower on TRT.

Table 3

Correlation of Lists 1 and 2 of the TRT with PAT reading comprehension

Grade levels	Age levels	Correlation coefficient (r)
2	8	74**
3	9	.74**
4	10	.79**

** = p<.01

Table 4

Tests of internal consistency for Lists 1 and 2 of TRT, using split-half procedure (unequal length, Spearman-Brown)

TRT	Grade level	Age level	Split-half correlation coefficient
List 1	2	8	.84
List 2	3	9	.88
List 2	4	10	.89

Tests of internal consistency for the TRT (i.e., tests of reliability) are shown in Table 4. The split-half correlation coefficient (unequal length Spearman-Brown) for List 1 was .84; List 2, standard 3 was .88; and List 2, standard 4 was .89.

To summarise the validity checks, the purpose was to find out whether the TRT was a reliable method of assessing print exposure with 8, 9 and 10 year old children based on the TRT. The results showed that List 1 and List 2 of the TRT were reliable, and that there was a good correlation between the TRT and PAT reading comprehension. Above-average readers ticked more titles and fewer foils than below-average readers, indicating that the above-average readers read more books.

The value of reading lots of books

Does reading make you smarter? Research suggests that exposure to print is associated with larger vocabulary, general knowledge and verbal skills. As Stanovich puts it, "if 'smarter' means having a larger vocabulary and more world knowledge in addition to the abstract reasoning skills encompassed within the concept of intelligence, as it does in most laymen's definitions of intelligence, then reading may well make people smarter".

While encouraging children to become life-long readers, and providing opportunities for children to read during school, is valuable, it also appears that the amount of out-of-school reading is significant. Studies have shown that the amount of reading during the long summer break away from school accounts for a larger discrepancy between high and low-achieving students than the time spent in school.

What can teachers do?

The objective of this study was to design and test a method of assessing children's exposure to print that is suitable for use in New Zealand standard 2, 3 and 4 classrooms. The TRT appears to be a good way of assessing children's print exposure in order to see how much recreational reading they are doing. Since the TRT has a good correlation with PAT Reading Comprehension, it is likely that poor readers would score low on the test, while good readers would score high. Children scoring low on the TRT will need to be encouraged to do more reading. While taking into consideration that some children do not read because they are poor decoders, there are also children with good decoding skills who do not read. Teachers who want to encourage their pupils to do more reading, must consider their decoding ability as well as the child's interests when selecting reading material, so that children can read the text with ease and fluency.

In selecting books for those who can read but don't read, the emphasis should be on "selling" books so they will want to read more. But in the case of pupils who don't read because they can't read, the emphasis must be on both selling books as well as selecting books or articles that are within their decoding ability (e.g., select School Journal stories which are graded for difficulty, using the School Journal Catalogue). For poor readers, another technique is to audiotape the books, so they can read-along, or to read to a "buddy" who can help them with hard words. In short, the TRT will identify those who need to read, but it is the teacher who has to select the right books for the right pupil, and sell the value of reading.

The Title Recognition questionnaires and marking keys in the following *set* item may be photocopied and used to identify children who need to be encouraged to read more.

Table 5
Items From the Title Recognition Test, List 1

Title	% recognition	
	Above-average	Below-average
Nate the Great	45.5	34.1
James and the Giant Peach	79.5	63.6
Avocado Baby	20.5	9.1
The Witch in the Cherry Tree	70.5	61.4
Wacky Wednesday	72.7	43.2
The Iron Man	43.2	27.3
Freckle Juice	34.1	18.2
Flat Stanley	34.1	13.6
The Enormous Crocodile	70.5	47.7
Mrs. Armitage on Wheels	47.7	18.2
Hairy Maclary from Donaldson's Dairy	81.8	29.5
Willy the Wimp	88.6	75.0
The Twits	88.6	63.6
Cabbage Patch Fib	34.1	2.3
The Paw Thing	36.4	29.5
Mister Magnolia	25.0	13.6
Ralph S. Mouse	63.6	27.3
What-a-Mess	59.1	45.5
The Great White Man Eating Shark	81.8	56.8
Beaver Towers	61.4	45.5
The Giraffe and the Pelly and Me	52.3	15.9
The Mouse and the Motorcycle	54.5	31.8
Fantastic Mr. Fox	81.8	47.7
The Butter Battlebook	15.9	6.8
Pippi Longstocking	68.2	34.1

Foils List 1	% recognition	
	Above-average	Below-average
Joanne	2.3	20.5
It's My Room	2.3	25.0
Hot Top	4.5	20.5
Don't Go Away	0.0	25.0
The Hideaway	9.1	6.8
The Missing Letter	0.0	25.0
Sarah Goes to Hollywood	2.3	25.0
The Schoolhouse	4.5	22.7
He's Your Little Brother	13.6	25.0
The Lost Shoe	2.3	38.6
Skateboard	0.0	20.5
Curious Jim	4.5	2.3
The Rollaway	13.6	13.6
Sally's Summer Holiday	4.5	25.0

Table 6
Items From the Title Recognition Test, List 2

Item	% recognition	
	Above-average	Below-average
The Phantom Carwash	30.8	10.3
James and the Giant Peach	92.3	49.2
The Hobbit	59.0	41.0
Under the Mountain	51.3	28.2
The Wednesday Wizard	74.4	61.5
Kristy's Great Idea	51.3	28.2
The Halfmen of O	53.8	10.3
Agnes the Sheep	48.7	7.7
Boy	71.8	23.1
Little House on the Prairie	48.7	10.3
Anastasia Krupnik	20.5	2.6
The Silent One	79.5	41.0
Five Get Into a Fix	28.2	5.1
Quirky Tales	56.4	28.2
Several Things are Alive and Well and Living in Alfred Brown's Head	51.3	23.1
Matilda	92.3	46.2
Bow Down Shadrach	59.0	30.8
Boy Crazy Stacey	48.7	20.5
Stonelight	33.3	20.5
Fudge-a-Mania	48.7	25.6
Starring Sally J. Freedman as Herself	20.5	2.6
The Wind in the Willows	94.9	71.8
The Worst Soccer Team Ever	79.5	38.5
Karen's Penpal	35.9	15.4

Foils List 2	% recognition	
	Above-average	Below-average
Joanne	12.8	15.4
It's My Room	12.8	20.5
Hot Top	7.7	28.2
Don't Go Away	0.0	15.4
The Hideaway	25.6	20.5
The Missing Letter	2.6	23.1
Sarah Goes to Hollywood	2.6	17.9
The Schoolhouse	5.1	33.3
He's Your Little Brother	7.7	33.3
The Lost Shoe	2.6	28.2
Skateboard	10.3	23.1
Curious Jim	5.1	2.6
The Rollaway	10.3	30.8
Sally's Summer Holiday	2.6	12.8

Notes

Susan Dymock is a doctoral student at the University of Auckland.

While doing fieldwork for her PhD Thesis on the relationship between decoding and reading comprehension she designed and tested this New Zealand version of the Title Recognition Test (TRT). Full details of the study can be found in her PhD Thesis (in progress).

She would like to acknowledge the assistance of her supervisor, Dr Tom Nicholson, University of Auckland, especially in the area of data analysis.

See following **set** item, *TRT Title Recognition Test,* for list of references.

item 12

set
number one 1995

TRT

TITLE RECOGNITION TEST

Adapted by Susan Dymock

University of Auckland

HOW MUCH DO YOUR STUDENTS READ? Here is a quick way of finding out. Note: this TRT has been designed with New Zealand children in mind. An adaptation could be made for Australian readers, see the previous ***set*** item **Measuring Print Exposure in New Zealand Classrooms** for details, and notes.

Administering the Title Recognition Test (TRT)

There are two forms of the Title Recognition Questionnaire. List 1 is for standard 2 (year 3), and List 2 is for standards 3 and 4 (years 4 and 5).

After the TRT has been distributed to each child, read the instructions at the top of the questionnaire which says, "Below you will see a list of book titles. Some of the titles are names of actual books and some of the titles are not real books. Be careful not to tick these made-up titles. You are to read the names and put a tick next to the names of those that you know are real books. Do not guess, but only tick those that are real books. Remember, some of the titles are not real books. They are there just to trick you. So be sure only to tick the real titles, and not the trick titles."

Following the instructions, children should be given time to ask questions.

The TRT takes approximately 5 minutes to administer.

Scoring the Title Recognition Test

Step 1. Count the total number of titles ticked. Count the total number of foils or false alarms ticked.

Step 2. Calculate the recognition rate. To calculate the recognition rate you divide the number of titles ticked by 25 (total number of titles) and multiply by 100. So if a child ticked 12 of the 25 titles, their recognition rate would be 48 percent (12/25 x 100 = 48).

Step 3. Calculate the false alarm rate. To calculate the false alarm rate divide the number of foils ticked by 14 (total number of foils) and multiply by 100. So if a child ticked 3 of the 14 foils, their false alarm rate would be 21 percent (3/14 x 100 = 21).

Step 4. Calculate the corrected score. This score is calculated by deducting the false alarm rate from the recognition rate. Using the above example, the corrected score would be 27 percent (48 - 21 = 27).

Interpreting the results

Once the corrected score for each reader has been calculated, the score needs to be interpreted. As reported in the previous ***set*** item, the above-average standard 2 readers' mean corrected score for List 1 of the Title Recognition Test (TRT) was 55 percent, and the below-average readers' mean corrected score was 13 percent. Based on these results, if a standard 2 reader scored around 55 percent one can infer that they have read or listened to a large number of books. In other words, this reader has a high level of print exposure. However, if for example, a standard 2 reader has a corrected score of 20 percent on the TRT, then it can be inferred that they have not read or listened to a large number of books. Or, to put it another way, this child seems to have a low level of print exposure.

In List 2 of the TRT, which is more difficult, the above-average standard 3 readers mean corrected score was 43 percent, and below-average readers mean corrected score was 10 percent. The mean corrected score for above-average standard 4 readers was 54 percent. The mean corrected score for below average standard 4 readers was 6 percent. (See also tables 5 and 6 in the previous ***set*** item).

If pupils score near the above-average mean corrected score for their class level, one can be fairly confident that they are reading or listening to a large number of books. In other words, they have a high print exposure.

However, if a pupil's score is near the mean corrected score for below-average readers for their class level, or even halfway between the below-average and above-average score, then it is possible that the reader is not reading or listening to a large number of books.

What then should teachers do?

Check the TRT results with other tests such as Progressive Achievement Tests (PAT). In particular, check the Reading Comprehension and Vocabulary subtests (of PAT). Readers who score above-average on PAT (Reading Comprehension) should score well on TRT. Likewise, readers who score low on PAT (Reading

Comprehension), should score low on TRT. But there may be exceptions to these rules. Let's discuss them.

Low PAT/High TRT

This reader may be "reading", however the PAT results suggest they are not so good at comprehending what they read. If a reader scores low on PAT yet high on TRT, it may be possible that the reader lacks metacognitive skills for dealing with different text. For example, they may be unaware when a breakdown in comprehension occurs and be unable to apply the necessary strategies when this happens.

It is also possible that such pupils do not have a good understanding of the structure of text, so they have trouble in making sense of what they read. Research shows that readers who are aware of narrative and expository text structures have few problems comprehending. Knowing how to put a structure on what they read helps to make the material more memorable. It is likely that these children would benefit from text structure instruction.

The low PAT score could also be the result of poor test taking skills, or maybe their parents read them lots of books at home, knowing that their children are not good readers on their own. These are possibilities which need to be checked further.

Low PAT/Low TRT

There are several reasons why readers may score low on both PAT and TRT. First, it is possible that these readers are struggling with the words. That is, they are poor decoders. These readers require assistance with developing their decoding skills.

Photocopy, then cut along line.

Title Recognition Questionnaire - List 1

Name: ______________________ **Date:** ______________________

Below you will see a list of book titles. Some of the titles are names of actual books and some of the titles are not real books. Be careful not to tick these made-up titles. You are to read the names and put a tick in the box next to the names of those that you know are real books.

Do not guess, but only tick those that are titles of real books. Remember, some of the titles are not real books. They are there just to trick you. So be sure only to tick the real titles, and not the trick titles.

☐ Nate the Great
☐ Joanne
☐ James and the Giant Peach
☐ It's My Room
☐ Avocado Baby
☐ The Witch in the Cherry Tree
☐ Wacky Wednesday
☐ The Schoolhouse
☐ The Iron Man
☐ Freckle Juice
☐ Hot Top
☐ Flat Stanley
☐ Don't Go Away
☐ The Enormous Crocodile
☐ Curious Jim
☐ Mrs. Armitage on Wheels
☐ Hairy Maclary from Donaldson's Dairy
☐ The Hideaway
☐ Willy the Wimp
☐ The Twits
☐ Cabbage Patch Fib
☐ Sarah Goes to Hollywood
☐ The Paw Thing
☐ Mister Magnolia
☐ The Missing Letter
☐ Ralph S. Mouse
☐ He's Your Little Brother!
☐ What-a-Mess
☐ The Great White Man Eating Shark
☐ Beaver Towers
☐ The Rollaway
☐ The Giraffe and the Pelly and Me
☐ The Mouse and the Motorcycle
☐ Fantastic Mr. Fox
☐ The Lost Shoe
☐ The Butter Battlebook
☐ Skateboard
☐ Pippi Longstocking
☐ Sally's Summer Holiday

Second, it is possible that these readers just don't like to read. Or perhaps they don't have access to public libraries. School libraries are not open to children during holiday breaks, and are often not open a week before school holidays commence. It is important then that children have easy access to public libraries when they have a lot of leisure time. It is also possible that these readers have little access to books at home.

High false alarm rate

There are several possible reasons why there could be a high false alarm rate. First, the child may be guessing. Second, the child may not have understood the directions and has become confused. Third, it is also possible that the child could have poor decoding skills. In other words, the child may not be able to cope with the words in the TRT. (If you suspect this is the case, you could try giving the test again, but this time reading each title aloud to the pupil.)

Reader profile

I have designed a questionnaire (see Figure 1) to assist teachers with finding answers to some of the questions outlined above (i.e., whether or not the child likes to read, whether or not they have access to public libraries, whether or not there are books available at home to read, and how the child spends their leisure time). The Reader Profile may assist teachers in finding answers to why a child is not reading.

Photocopy, then cut along line.

Title Recognition Questionnaire - List 2

Name: ______________________ **Date:** ______________________

Below you will see a list of book titles. Some of the titles are names of actual books and some of the titles are not real books. Be careful not to tick these made-up titles. You are to read the names and put a tick in the box next to the names of those that you know are real books.

Do not guess, but only tick those that are titles of real books. Remember, some of the titles are not real books. They are there just to trick you. So be sure only to tick the real titles, and not the trick titles.

☐ The Phantom Carwash
☐ Joanne
☐ James and the Giant Peach
☐ It's My Room
☐ The Hobbit
☐ Under the Mountain
☐ Hot Top
☐ Don't Go Away
☐ The Wednesday Wizard
☐ Kristy's Great Idea
☐ The Hideaway
☐ The Halfmen of O
☐ Agnes the Sheep
☐ The Missing Letter
☐ Boy
☐ Little House on the Prairie
☐ Anastasia Krupnik
☐ Sarah Goes to Hollywood
☐ The Silent One
☐ The Schoolhouse
☐ Five Get Into a Fix
☐ He's Your Little Brother
☐ Quirky Tales
☐ Several Things are Alive and Well and Living in Alfred Brown's Head
☐ The Lost Shoe
☐ Skateboard
☐ Matilda
☐ Bow Down Shadrach
☐ Boy Crazy Stacey
☐ Stonelight
☐ Curious Jim
☐ Fudge-a-Mania
☐ Starring Sally J. Freedman as Herself
☐ The Rollaway
☐ The Wind in the Willows
☐ Karen's Penpal
☐ Sally's Summer Holiday
☐ The Worst Soccer Team Ever
☐ Ramona the Brave

Marking Key

Title Recognition Questionnaire - List 1

	Titles	Foils
Nate the Great	☐	
Joanne		☐
James and the Giant Peach	☐	
It's My Room		☐
Avocado Baby	☐	
The Witch in the Cherry Tree	☐	
Wacky Wednesday	☐	
The Schoolhouse		☐
The Iron Man	☐	
Freckle Juice	☐	
Hot Top		☐
Flat Stanley	☐	
Don't Go Away		☐
The Enormous Crocodile	☐	
Curious Jim		☐
Mrs. Armitage on Wheels	☐	
Hairy Maclary from Donaldson's Dairy	☐	
The Hideaway		☐
Willy the Wimp	☐	
The Twits	☐	
Cabbage Patch Fib	☐	
Sarah Goes to Hollywood		☐
The Paw Thing	☐	
Mister Magnolia	☐	
The Missing Letter		☐
Ralph S. Mouse	☐	
He's Your Little Brother'		☐
What-a-Mess	☐	
The Great White Man Eating Shark	☐	
Beaver Towers	☐	
The Rollaway		☐
The Giraffe and the Pelly and Me	☐	
The Mouse and the Motorcycle	☐	
Fantastic Mr. Fox	☐	
The Lost Shoe		☐
The Butter Battlebook	☐	
Skateboard		
Pippi Longstocking	☐	
Sally's Summer Holiday		☐

Step 1: Total Number of Titles/Foils ______ ______

Step 2: Recognition rate (R.R.) = Total titles ticked / 25 x 100 = ______

Step 3: False alarm rate (F.A.R.) = Total foils ticked / 14 x 100 = ______

Step 4: Corrected score (C.S.) = R.R. – F.A.R. = ______

Marking Key

Title Recognition Questionnaire - List 2

	Titles	Foils
The Phantom Carwash	☐	
Joanne		☐
James and the Giant Peach	☐	
It's My Room		☐
The Hobbit	☐	
Under the Mountain	☐	
Hot Top		☐
Don't Go Away		☐
The Wednesday Wizard	☐	
Kristy's Great Idea	☐	
The Hideaway		☐
The Halfmen of O	☐	
Agnes the Sheep	☐	
The Missing Letter		☐
Boy	☐	
Little House on the Prairie	☐	
Anastasia Krupnik	☐	
Sarah Goes to Hollywood		☐
The Silent One	☐	
The Schoolhouse		☐
Five Get Into a Fix	☐	
He's Your Little Brother		☐
Quirky Tales		
Several Things are Alive and Well and Living in Alfred Brown's Head	☐	
The Lost Shoe		☐
Skateboard		☐
Matilda	☐	
Bow Down Shadrach	☐	
Boy Crazy Stacey	☐	
Stonelight	☐	
Curious Jim		☐
Fudge-a-Mania	☐	
Starring Sally J. Freedman as Herself	☐	
The Rollaway		☐
The Wind in the Willows	☐	
Karen's Penpal	☐	
Sally's Summer Holiday		☐
The Worst Soccer Team Ever	☐	
Ramona the Brave	☐	

Step 1: Total Number of Titles/Foils ______ ______

Step 2: Recognition rate (R.R.) = Total titles ticked / 25 x 100 = ______

Step 3: False alarm rate (F.A.R.) = Total foils ticked / 14 x 100

Step 4: Corrected score (C.S.) = R.R. – F.A.R. = ______

Figure 1
Reader Profile

Reader Profile

Name ______________ **Class** ______________ **Date** ______________

1. Which two of the following activities would you rather do and why?
   A. Would you rather read or play with your friends?
   ____
   Why? ______________
   B. Would you rather watch television or read?
   ____
   Why? ______________
   C. Would you rather clean up your room or read?
   ____
   Why? ______________

2. How often do you read for fun during your free time? (Circle one)
   A. Never
   B. Less than once a week
   C. Once or twice a week
   D. Almost every day

3. About how many minutes would you read each day after school and before you go to bed? (Circle one)
   A. None
   B. 15 minutes
   C. 30 minutes
   D. 45 minutes
   E. One hour
   F. More than one hour

4. About how much time do you spend watching television each day? (Circle one)
   A. None
   B. Less than 1 hour
   C. 1 hour
   D. 2 hours
   E. 3 hours
   F. 4 hours
   G. 5 hours or more

5. About how many books do you personally own? (i.e just you, not your family) (Circle one)
   A. 1-5
   B. 5-10
   C. 15-20
   D. 20-25
   E. More than 25

6. When do you do most of your reading? (Circle one)
   A. In bed before you go to sleep
   B. In spare time at weekends
   C. After school
   D. During library time
   E. In the classroom

7. How do you like to spend your spare time? Rate in order of preference: 1-5
   A. Watching television ____
   B. Playing sport ____
   C. Reading ____
   D. Playing with friends ____
   E. Other hobbies, such as ____

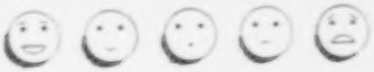
8. Are you a member of the local (public) library?
   A. Yes
   B. No

9. If you answered 'yes' to the above question, how often do you borrow books?
   A. Less than once a month
   B. About once a month
   C. More than once a month
   D. Hardly ever

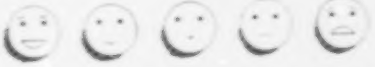
10. What is the title of the best book you have read recently?
    ____

11. Who is your favourite author?
    ____

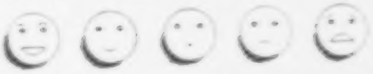
12. How do you feel about reading for fun at home?



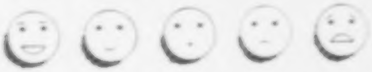
13. How do you feel about getting a book for a present?



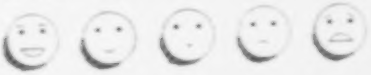
14. How do you feel about spending free time reading?



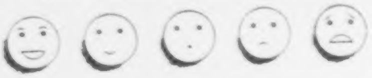
15. How do you feel about going to a bookstore?



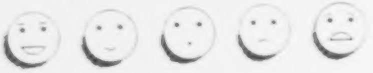
16. How do you feel about reading in school?



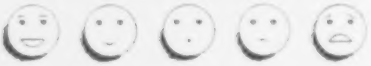
17. How do you feel about the stories/books you read as part of your reading programme at school?



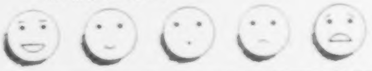
18. How do you feel when your teacher reads a story out loud?



19. How do you feel about how well you read?



20. How do you feel when you are asked to read out loud to the teacher?



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item 13

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Assessment Strategies

FOR THE NEW ZEALAND CURRICULUM FRAMEWORK

Cedric Croft
New Zealand Council for Educational Research

THE *New Zealand Curriculum Framework* sets direction and principles for all curriculum statements covering particular subject areas. To date we have seen revised statements for mathematics, science and English, with technology to follow. There are priorities for assessment within the curriculum framework. What are they and how might they be implemented in classrooms?

It is important to acknowledge from the very outset that the *New Zealand Curriculum Framework* is not first and foremost a blueprint for school assessment, but a document which helps establish the broad values, competencies, priorities, and processes of New Zealand classrooms. It is true that assessment techniques and materials play an important role within all classrooms, but with the exception of the "backwash" effect, where assessment tends to "drive" the curriculum rather than vice-versa, assessment is usually a silent partner until it is aroused.

Working from the inviolate principle that students' learning needs not teachers' assessment requirements must dominate a curriculum statement, there are nevertheless, a set of explicit and implicit priorities for assessment within the framework.

This paper identifies these priorities and outlines some assessment strategies that may be used within classrooms to support the *New Zealand Curriculum Framework*.

Essential skills

The new curriculum framework focuses on the following essential skills. The challenge for those implementing the framework is to find appropriate assessment strategies for these essential skills.

- Communication skills
- Numeracy skills
- Information skills
- Problem-solving skills
- Self-management and competitive skills
- Social and co-operative skills
- Physical skills
- Work and study skills

The assessment priorities

The assessment priorities contained within the framework can be seen as a set of general principles of intent which can also be described in standard assessment terms.

- To identify and analyse the extent and nature of learning within each key area of the curriculum. In standard assessment terms we are talking of assessment that is *formative* and *analytic*.
- To describe the range of skills, concepts, problem-solving behaviour, attitudes and competencies a student has developed, without reference to these attributes as demonstrated by others. We are now talking of measurement and assessment as being *criterion-referenced*.
- To be a direct consequence of the teaching and learning programmes each teacher or school has formulated, to meet individual or collective objectives. This describes assessment that is primarily *school-based* and *teacher-developed*.

Key Terms in School Assessment

Measurement: broadly defined it is the process of assigning numbers or other identifiers to behaviour, according to rules. In the context of classrooms, measurement is based on the classification of student performance, using set procedures. Administering a test, completing a checklist, recording an observation, obtaining a running record, rating a product or performance, are all primarily acts of measurement.

Assessment: a process of surveying information based on measurement up to a particular point in time. The classification, interpretation, and description of this information forms an assessment. The predominant aim of an assessment is to *describe* an individual's level of performance.

Evaluation: involves making judgements of worth. An assessment provides the information on which these judgements of worth are based.

The reality is that these distinctions fade in the classroom, as a teacher may go through the sequence of measuring, assessing, and evaluating as an intuitive process. Observations are made (measurement), the data is interpreted and synthesised into an overall picture (assessment), and the judgements or decisions follow (evaluation). In practice, distinctions between measurement, assessment and evaluation may not be crucial, but they are nevertheless distinct processes, with somewhat different purposes and endpoints. Increasingly too, the term assessment seems to have become synonymous with measurement and evaluation and this recent use does not aid clear communication in a field that is already fraught with terminology that is unclear to some.

- Assessments will describe student progress and enable judgements to be made about progress, which are fair, relevant and accurate. In a technical sense this is assessment which is both *valid* and *reliable*.
- Assessment will fit within and help contribute to an overall picture of the development and progress of each student. Here we are talking of assessment that is *developmental, progressive* and *cumulative*.
- To provide assessment results that will have the same meaning and be interpreted in a common way by different teachers, parents and students. In other words results will be *interpretable, generalisable,* and *portable*.
- As one consequence of being school-based, assessment will express students' progress against broadly defined achievement levels, across various curriculum strands. In a general sense the levels are portrayed as being hierarchical. This may be described as *levels-based assessment*.
- Information which teachers record from their assessments will form the basis of profiles of individual students' achievement. *Profiles* will provide the basis of feedback to students and parents.
- Assessment as represented by a "framework of levels" may in due course constitute some form of numerical scale that could enable differences to be described within and between pupil's performance, in various subjects. This means that assessment will assist in *graded judgements* about individuals.
- Assessment data collected by individual schools may be set against a common framework of levels and, when aggregated, may provide information on the performance of the school system as a whole. These data may then contribute to national assessment and become another dimension of accountability.

To return to a more traditional measurement sense, what the foregoing means, is that *valid* assessment within the *New Zealand Curriculum Framework* will be:

- formative
- criterion-referenced
- school-based and teacher-developed
- reliable and valid
- based on development
- continuous and progressive
- portable and interpretable
- levels based
- summarised into profiles
- graded
- contribute to national assessments

So what's new?

Given that this set of assessment priorities has been isolated two questions follow: What's new? and How may these priorities be implemented in my school? To answer the first question, it seems that what is new is the priority for valid assessment to be:

- formative as opposed to summative;
- based on in-school development as opposed to assessments (particularly in the form of standardised tests) that may have been developed outside the school;
- set against a "framework of levels" which will operate across all curriculum statements and the strands of each curriculum area, (e.g., the strands for mathematics are mathematical processes, number, measurement, geometry, algebra, statistics);
- embracing most strongly principles of criterion-referenced measurement, but minimising the normative basis of most educational measurement;
- able to be combined to form "profiles" of individuals, classes, schools or the national system. The exact nature and form of these profiles is yet to be clarified.

At this point I should add quite strongly, that many aspects of assessment in the framework are not new. The clear intent in the document is that current "best practice" will be retained and added to. However, best practice is not identified or defined, so this may pose some difficulty when schools are identifying which of their current practices are indeed examples of best practice. Some guidance however may be obtained from the five points above. In addition, the recent Ministry of Education publication, *Assessment Policy to Practice*, provides many examples of valid assessment procedures.

As an aside, let us look at the new vogue in assessment, variously known as authentic assessment, performance-based assessment, direct assessment and alternative assessment, which currently dominates American literature on school assessment. My reading of this is that this "new development" has come about in part as a reaction to the predominance in the United States of standardised assessment programmes, maintained by major publishers. Many assessment practices in New Zealand and Australia, particularly in the primary sector, already show many of the hallmarks of authentic assessment. In other words, the assessment is embedded in curriculum tasks and activities that children are engaged in on a day-to-day basis reflecting the learning objectives that teachers see as most important. It would be wrong to imply that all aspects of authentic assessment are rosy, and equally wrong to stress just the difficulties associated with authentic assessment. Indeed, the lure of enhancing validity is a major impetus for authentic assessment, but it may be that the lure of enhanced validity may compromise reliability.

How can schools implement the priorities?

To address the second question posed earlier, we begin by identifying the possible assessment methods that can be used. There are a number of ways of assessing achievement, although some methods are better suited to some purposes than others. It is worth reiterating that the philosophy at the heart of any assessment system should be the promotion of students' learning. However, assessment should not be an afterthought restricted to the end-point of units of work, courses, terms and so on.

The assessment possibilities that follow do not constitute an exhaustive list, but represent approaches that seem most in keeping with the emphases of the curriculum framework.

- Direct observation
  - Anecdotal records
  - Activity diaries

  Any assessment in this style is limited to what students are actually accomplishing, instead of what they might be able to accomplish.

- Records of achievement
  These may also be referred to as students' profiles and usually constitute a record of work completed and levels of achievements made. There are parallels between records of achievement and portfolios of work.
- Contracts negotiated with students
  The outcomes are often specified and the methods of assessment are normally agreed to in advance.
- Self-assessment
  Some reasonable sense of self-insight is a prior necessity, but this needs to be complemented by a clear understanding of what is to be assessed and an agreed format for an assessment.
- Peer assessment
  It usually takes time to build up the feelings of trust and acceptance on which this assessment method is based. Skilful handling by the teacher is an important component. Again, a clear understanding of what is to be assessed and how this is to be done is needed.
- Parent-teacher conferences
  This approach goes beyond the traditional reporting evening and becomes a two-way exchange. Conferences of this type may then contribute a new dimension to student assessment.
- Student-teacher conferences
  The uses cited for these conferences include diagnosing learning difficulties, monitoring student work progress, developing insights into student work. Their uses are maximised when the focus is clear.
- Multiple-choice and short-answer items
  These types of test items take quite some time to construct if they are done properly. It is also vital that they go through a trial process. If their content validity is assured (that is, if they measure the content they claim to measure) they may be used on other occasions as well, so the investment in time may be well worthwhile.
- Alternate choice and matching items
  These are two other common forms of test items. To be effective they need to be prepared according to established guidelines. They may also be used on other occasions if their content validity is assured.
- Cloze tests
  As an early example of authentic assessment, cloze tests have application in measuring reading comprehension, mastery of content and readability studies.
- Essay-type tests
  These do not overcome all problems associated with recognition-type tests. Essay tests introduce difficulties of their own as far as scoring is concerned. Essay tests and objectively-scored items are best seen as complementary forms of assessment.
- Performance tests
  For example role playing, simulation and work samples.
  Irrespective of their authenticity and probable validity, the logistics of these forms place limits on their applicability within classrooms.

Frames of reference

There are three common frames of reference which enables any form of measurement to be interpreted as an assessment.

- *Norm referencing* – the performance of an individual is compared with performance of an appropriate reference group.

  "Mary has performed better than 75 percent of her age peers" is a *normative assessment.*

- *Criterion referencing* – the performance of an individual is compared with objectives, a defined area of content, or a set of performance standards.

  "Mary has achieved at the desired performance level on the recent vocabulary test" is a *criterion-referenced assessment.*

- *Ipsative referencing* – the performance of an individual is referenced against other aspects of himself or herself. A profile may be ipsative, as the high points or low points using the individual as the reference point. Interest inventories and attitude scales are a usual example of ipsative measurement.

  "Mary is stronger in physical skills than in creative arts" is an *ipsative* assessment.

Validity and reliability

Irrespective of the method of assessment to be chosen, or the frame of reference for interpretation, issues of validity and reliability will still be present. There are three usual strategies used to identify the validity of tests or other approaches to classroom measurement:

- criterion studies to establish the accuracy with which a test predicts a criterion
- content studies
- construct studies.

These in turn relate to the four major aspects of validity of educational assessments:

- content
- concurrent
- predictive
- construct.

Traditionally, content validity has dominated school assessment (as it should), construct validity is virtually ignored, and the remaining two forms probably fall somewhere in between. However, the progressive move to school-based assessment will demand a re-think of how concurrent and predictive validity will be demonstrated, when it is appropriate to do so. In this era of increasing accountability it may no longer be satisfactory for schools to "know" that their assessments are valid. It may prove necessary to be able to demonstrate this as well.

Assessment strategies

To implement assessment practices which support the curriculum framework, it is necessary to integrate:

- the essential skills,
- assessment priorities, and
- valid assessment methods suited to a particular essential skill.

While it is feasible to map valid assessment methods on to each of the eight areas of essential skills it is clear that some assessment methods are best suited to certain essential skills. However, relationships between the assessment pri- essential skills and assessment methods are not

Figure 1

Assessment Priorities in Curriculum Framework

Formative
Criterion referenced
School-based
Teacher-developed
Based on development
Continuous and progressive
Interpretable, communicable and portable
Summarised into profiles
Reliable and valid
Based on eight levels of achievement
Contributing to national assessment
Graded

ESSENTIAL LEARNING AREAS

Communication Skills
Numeracy Skills
Information Skills
Problem-solving Skills
Self-management and Competive Skills
Social and Co-operative Skills
Physical Skills
Work and Study Skills

ASSESSMENT METHODS

Direct Observations
Records of Achievement
Contracts
Self Assessment
Peer Assessment
Parent-teacher conferences
Student-teacher conferences
Multiple-choice and short answer tests
Cloze tests
Essay Type
Performance tests

quite as direct as it appears in that the assessment priorities over-arch both the skill areas and the methods of assessment. In a sense the assessment priorities provide a set of highlights which each assessment method may exhibit to a greater, or lesser degree. An overview of the three elements of assessment priorities, essential skills and assessment methods is shown in Figure 1.

Integrating these three elements to ensure that each skill area, or each activity within a skill area, is assessed in terms of the priorities of the framework, cannot be achieved in a "cookbook" fashion. Instead, the choice of a valid assessment method which best meets the needs of each essential skill area, necessitates a problem-solving approach by each teacher and each school.

Clearly, some assessment methods articulate better with some essential skill areas than others. For example, some communication skills might be *observed; assessed by peers; discussed at student-teacher* or *parent-teacher conferences; assessed by an essay test;* or *simulated in a performance setting.* Social and co-operative skills might also be *observed; assessed by each individual; assessed by peers, parents or teachers;* or *assessed in a role-playing setting.* Quite clearly, these skills are less likely to be assessed by *multiple-choice; short answer; essay;* or *cloze tests.* There are fewer ways of assessing physical skills with *performance tests* and *observation* the most valid.

The final choice of assessment method will always be determined by issues of validity focused by questions such as:

Why are we undertaking this assessment anyway?

What are we hoping to achieve?

What do we hope to alter as a result of this assessment?

How will we use the information we gain?

Who needs to know the outcome?

A problem-solving approach, as opposed to a recipe book approach, is at the heart of the recent curriculum changes. It seems appropriate that a problem-solving approach should be at the heart of assessment decisions as well.

Notes

Cedric Croft is a chief research officer, at the New Zealand Council for Educational Research and research group leader of the Learning Curriculum and Assessment Programme.

This item is based on a paper, *Assessment Strategies to Support the New Zealand Curriculum Framework,* presented by the author at a professional development seminar for principals, Tamaki Education Centre, April 1994.

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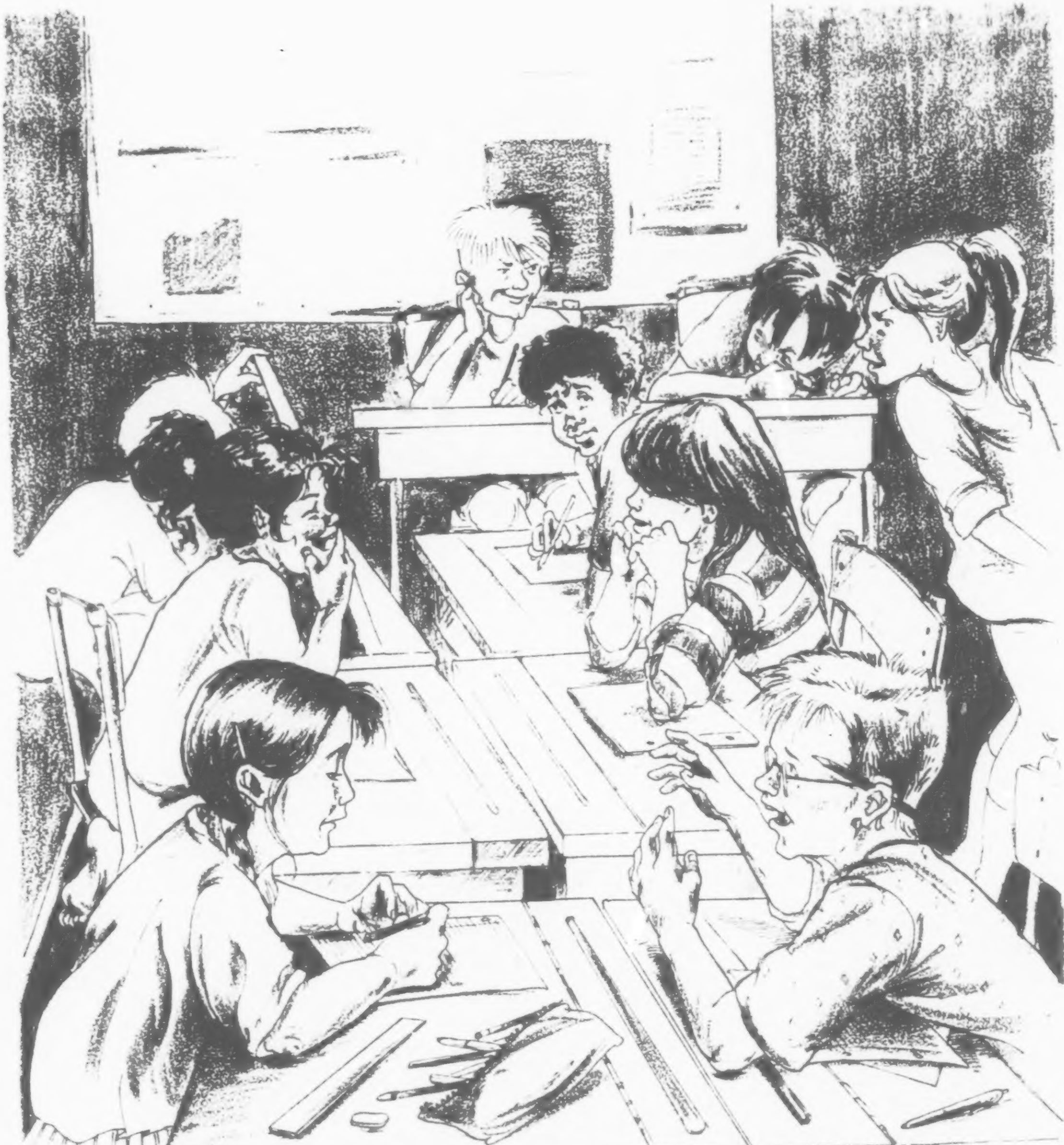
KINDLY TAKE YOUR SEATS

Nigel Hastings and Josh Schwieso
The University of Reading


Adele Jackson

Adele Jackson

Do children learn best sitting in groups or rows? British researchers Nigel Hastings and Josh Schwieso say the debate needs widening and teachers should experiment with switching room layouts to suit different tasks. They explain how furniture can be a flexible teaching tool while Maureen O'Connor visits two primary schools which have put their theories into practice.

It is not easy to find a primary classroom these days where children sit in rows. Fifteen years of research has painted a clear and consistent picture of how children are organised and taught by British primary teachers: they are generally seated around tables in groups of four to seven.

The most common rationale for this arrangement is that it enables them to collaborate in their work and develop communication skills. However, learning activities which require collaboration are difficult to design and are rarely used by most teachers.

As a consequence, when they are not directly involved with their teachers, most of the tasks children are asked to engage in are individual in nature: they all have their own work to complete. It might be that children still discuss their individual work and gain from these exchanges, but the evidence is that a minority of children's classroom conversations are work-related.

Taken as a body, the research evidence can sustain a bold and challenging claim. Children in British primary schools are generally expected to sit in groups but to work as individuals.

If we set alongside this claim the Elton Committee's finding that the most frequent disruptive behaviour reported by primary teachers is "inappropriate talk", some obvious questions about the match between contexts and tasks begin to arise.

Echoing others, the Three Wise Men raised the issue in their 1992 discussion paper: "All too often there may be a mismatch between the collaborative setting of the group and the individual learning tasks which are given to pupils. The result is that the setting may distract pupils from their work".

They could have been bolder. Evidence already existed that would have justified a claim that the setting *does* distract pupils. Two small studies recently conducted at the University of Reading have confirmed that matching seating arrangements to task requirements is important. Two seating arrangements were investigated – groups and rows.

The first study was undertaken with two parallel classes of 31 children in years 5 and 6 (standard 4 and form 1). Observations were made of children while they were doing individual work in English or mathematics.

Each class was observed on four days a week over three, two-week phases. Class A sat in rows for the first fortnight, groups for the second fortnight and rows again for the final two weeks. For class B the sequence was groups, rows, groups.

The results were clear. Children seated in rows spent more time engaged with their work. Class A pupils were "on task" for an average of 75 percent and 79 percent of the two phases in rows and for 56 percent when seated in groups. For class B, the figures were 76 percent for rows and 66 percent and 65 percent for the group phases.

The effects of these different seating arrangements on children varied considerably, but there was a pattern. For children who concentrated well when seated in groups, moving to rows made no appreciable difference: they could concentrate well in either context. However, for the eight most easily distracted children in each class, sitting in rows made a dramatic difference.

In Class A, they were on-task for 72 and 78 percent of the two phases in rows but for just 38 percent when seated in groups. In Class B, the figures were 72 percent in rows and 44 and 46 percent in the group seating phases. Most of these children more than doubled their involvement with work and, taken together, they achieved around the class average when seated in rows.

The consequences of a mismatch between seating arrangements and the nature of the learning activity for the most distractible children – some of whom may also be disrupting others by their "off-task" activities – was again demonstrated in the second study.

This was undertaken with a teacher of a year 3 and 4 class in which the behaviour of two boys, Kevin and Luke, was causing serious concern and disruption. Classroom observation identified a third child sitting at the same table, Mark, whose behaviour and level of involvement with his work also warranted concern.

Observations over three weeks at times when children were meant to be engaged in what the Americans call "individual seat-work", revealed that these three pupils were out of their seats for more than two-thirds of the time and engaged with their work for under a quarter. The class as a whole was working at the tasks in hand for an average of just under half the time.

Reviewing this evidence, the teacher decided to try to settle the class by seating the class in rows for individual work. Over the next three weeks the class average rose to 78 percent. To everyone's surprise and delight, the figures for each of the three boys were above this class average and their disruptive effect on the rest of the class decreased considerably. Far from feeling oppressed and trapped in their seats, they thought the new set-up was wonderful.

These studies add to the evidence showing that the situations in which we ask children to work are often not well chosen and can make life particularly difficult for the most distractible. They also show that improvements can be brought about.

But in considering implications for practice, a number of points need bearing in mind. First, these studies only examined the effects of different seating arrangements on children's on-task time. They did not measure learning outcomes. Research on learning gains under the two conditions is difficult and so far limited. However, time on-task is of significance as, although time spent working does not necessarily result in learning, it is pretty difficult to learn without spending time on it. Some of these children's average on-task rates were less than 25 percent when seated in their normal groups.

Second, although there are now a number of published studies demonstrating the effects of seating arrangements, they cannot sustain generalised claims as the classes studied were not selected to be representative of primary classes as a whole. On the other hand, there is no reason to suppose that they were particularly unusual. Moreover, the fact that similar results have emerged from a variety of studies undertaken in different parts of the country and in different types of schools, does give rise to a degree of confidence in generalising.

However, the potential value of educational research of this sort does not lie only in findings that can be generally applied. It can also be a valuable, if temporarily uncomfortable, spur to review and development in schools. The fact that seating arrangements have been found to have such marked consequences for children in the classrooms studied may well prompt boards of trustees, governors, headteachers and individual teachers to review practice.

Some teachers who have done just this have developed a flexible and strategic approach to classroom seating and consider classroom organisation as a part of their planning. Their children have learned two or three basic arrange-

Consider common sense as part of the furniture

You only have to look around my office to see that what we are talking about is commonplace in adult life, says Katie Diffin, head of the Manor Primary School in Reading.

If I have written work to do I sit at my desk, if I want an informal discussion I use the comfortable chairs, and the table is there for more formal meetings.

Manor is one of a number of schools in Berkshire which have been influenced by Nigel Hastings' work on classroom seating arrangements through their in-service links with Reading University. This does not mean returning to Dennis Potter's nightmare *Singing Detective* scenario of children sitting in rigid rows with their hands on their heads. It does mean, says Mrs Diffin that a teacher should choose the correct setting for a teaching purpose and for the needs of individual children.

This means she says, that for whole-class teaching children must be able to see the teacher easily, for collaborative work they should sit in groups, and for individual tasks they should not be distracted by their neighbours. The best way to increase the work-rate of the most distractible children, she thinks is to reduce the distraction by insisting that they sit alone or in pairs without anyone facing them.

Her deputy, Carol Pearce, who takes a year 6 (form 1) class, puts the philosophy into practice by ranging most of her room's tables in a horseshoe within which four separate tables face the front. That is the way the room stays, she says, when she is talking to the whole class or when the children are working on individual tasks. For collaborative work, they spin the tables together to accommodate groups of four or six and for "circle time" – class discussion – they complete the square.

If a child is being particularly difficult he or she might sit on a single table away from the rest of the class, she says. She has little doubt that both the quantity and the quality of the class's work has improved since she began to experiment with class seating.

Her pupils seem to agree. They are aware of the purpose of each arrangement, can reorganise the room very quickly and say they appreciate the virtues of minimal distraction when they are working.

There is no doubt, Mrs Diffin says, that the work rate goes up with a more appropriate seating arrangement. She has not attempted to change the whole school's practice overnight, but is relying on observation to persuade staff that the permanent groups they were using might not always be the best approach to behaviour management or learning.

As far as she is concerned the primary norm of sitting children in groups for all their activities is outdated. And the harder children find it to concentrate, the more they will benefit from a seating plan where they do not have eye contact with their friends and cannot kick them under the table or interfere with their neighbours' books.

At Lynch Hill combined school in Slough, headteacher Jill Forbes has gone through a similar learning process, and come to similar conclusions. One of her strategies to avoid distraction for children at work was to invest in blinds for all the windows, to cut out glare and reduce the view of the playground.

Then she and some of her staff met Nigel Hastings on an in-service training course on behaviour management. The Lynch Hill team raised the question of whether seating arrangements were relevant in a school serving a seriously deprived council estate.

His advice, plus trial and error at school, soon convinced Ms Forbes that they were very relevant indeed.

> We leave it very much to class teachers, and almost every class has a different arrangement of tables. We take into account not only the nature of the task but the needs of individual children. Some emotionally disturbed children work better on their own facing a wall.
>
> We had one boy who was quite disturbed by sitting in a group but was able to work happily in a pair with another child, whose own self-esteem was raised by being able to provide some support for his neighbour.
>
> The main thing is to be aware of what you are doing with the furniture and what effect different arrangements will have.

But Jill Forbes has some reservations about making rigid rules about seating.

> In a catchment area like ours it is very important to encourage children to feel positive about school.
>
> Some of them come to us with very few social skills, and in the beginning they need to be in groups to learn to share, to exercise self-control and responsibility. It is a delicate balance

Such children, she thinks, also need security and stability at school when there is so little outside. Working in settled groups, and a minimum of furniture moving, helps build the confidence of the youngest children. At Lynch Hill, she says, most of the infants (New Entrants or kindergarten children) still sit around the traditional tables for groups of four or six with a gradual switch towards separate tables in rows as they move up the school.

Her colleague Marie Ingham is also concerned about the social implications of seating arrangements in classes where outside aggressions can easily be brought into school. "Ideally I would like to keep them in groups, so long as they are arranged so that I have eye-to-eye contact with all the children. They do need to know that I am aware of what they are doing. Pairs can be very difficult, and I make them earn the privilege of sitting by a friend. I would be very reluctant to have them in rigid rows. That does not really tie in with our aim to encourage their social as well as their intellectual development."

And while seating arrangements may be important, so too are issues of space and resources. Sitting children in rows, these teachers say, takes up more space. Sitting them in groups may be essential for some activities simply because they have to share expensive equipment. Nothing is as simple as it appears.

Maureen O'Connor, Journalist

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ments and move the furniture to suit the learning activity. Other teachers have been fortunate in being able to have some areas permanently arranged for collaborative work and others for individual tasks.

In the school where the first study took place, for instance, teachers have drawn on the evidence of the two classes and, 18 months on, employ two basic modes of organisation. Children move the furniture to match the task requirements and to meet particular needs.

In one class, for example, four children sit in a group for individual tasks, supported by a classroom assistant, while the rest work sitting in rows. When there is group work to be done, they all sit in groups.

In another class, however, the arrangement of tables in rows makes for overcrowding and it would be difficult for the teacher to get round to all the children. So there is a compromise with a mixture of rows and grouped tables for different tasks.

When a teacher's intention is that children should learn through collaboration – by exchanging ideas, hypothesising, debating or solving problems together – group seating arrangements make obvious sense. However, for individual work in which each child has his or her own work to complete, other arrangements such as horseshoes, L-shapes and rows may reduce the sources of distraction.

The crucial aim is to limit eye contact between pupils, but to make it easier between teacher and pupils. Every school will need to develop its approach within the constraints imposed by architecture, furniture and class sizes, but the available evidence should cause all to question the wisdom of sitting children in groups for all activities. It seems to make learning very difficult for some children.

Groups seated around tables have been the orthodox form of primary classroom organisation for the past 30 years, just as rows of seats were universal for decades before.

We have grown so accustomed to seeing children in primary classrooms seated in groups that any other layout seems improper. The idea of using any other arrangement – especially rows – may be difficult for many schools and teachers to entertain.

However, despite attempts by some journalists to cast the research as justifying "traditional teaching methods", the issue is not about whether it is better for children to sit in groups or rows. Nor is it about the relative merits of group work and individual work. It is about fitness for purpose. Arrangements that match one purpose are unlikely to be suitable for another.

If the thought of moving furniture to suit different activities fills the anticipating teacher's mind with the sound of scraping chairs and table legs, it should not. Just as children get out and pack away PE equipment, so they can learn two or three basic arrangements of furniture. The time taken should be more than compensated for by increased time on-task, quantity of work undertaken and, we suspect, in long-term quality of learning.

One commentator has suggested that the widespread practice of sitting children in the manifestly social context of a group, then asking them to get on with their own work and telling them off for talking, borders on cruelty. Expressed like this, it certainly seems an odd thing to do. Perhaps it is time to move on and embrace classroom seating as a pedagogical tool. It is more than just furniture.

Notes

Nigel Hastings is senior lecturer and director of in-service training at the University of Reading's department of education studies and management. Josh Schwieso is now senior lecturer in the school of psychology at the University of the West of England.

The research outlined here was reported in

Hastings, N. & Schwieso, J. (1994, October 21). Kindly take your Seats. *The TES*, pp. 3-4.

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and

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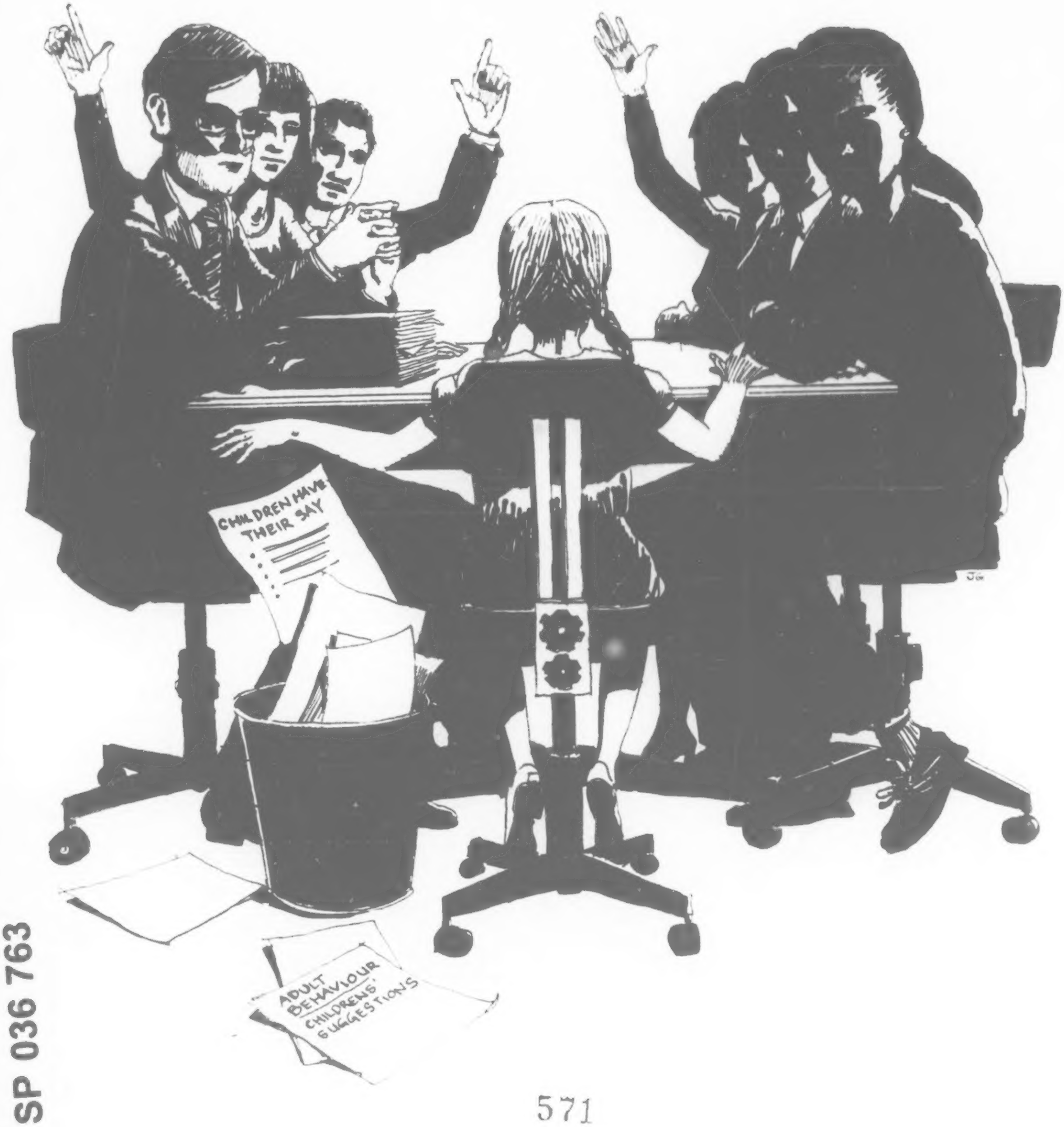
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CHILDRENS' SUGGESTIONS

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note Ed

Thank you to those readers who have written to say what they have enjoyed most about **set no 1, 1995**. We value your feedback and suggestions.

This issue focuses on the opinions and perceptions of those at the centre of education, the students. All too often, from their point of view, school exists for the sake of the teachers, not themselves. The following 15 articles by Australian, New Zealand and British educational researchers and teachers look at a range of issues from the students' point of view. What do they think "learning" is? How can the child's opinions be taken into account during an assessment by a psychologist? Can young children tell the difference between play and learning? What do students understand about technology and does that get in the way of learning the new curriculum? How did student teachers react to their selection interview?

Given the chance to express their opinions, children are surprisingly perceptive. In the words of eight year old Murali: "You have to be kind to the street kids because they miss their mum. Think about missing your mum."

Judith Wright
Editor

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15. **The Draw-a-Scientist Test**
Lynn Newton and Douglas Newton
How young children view science and scientists will effect their career choice as adolescents.

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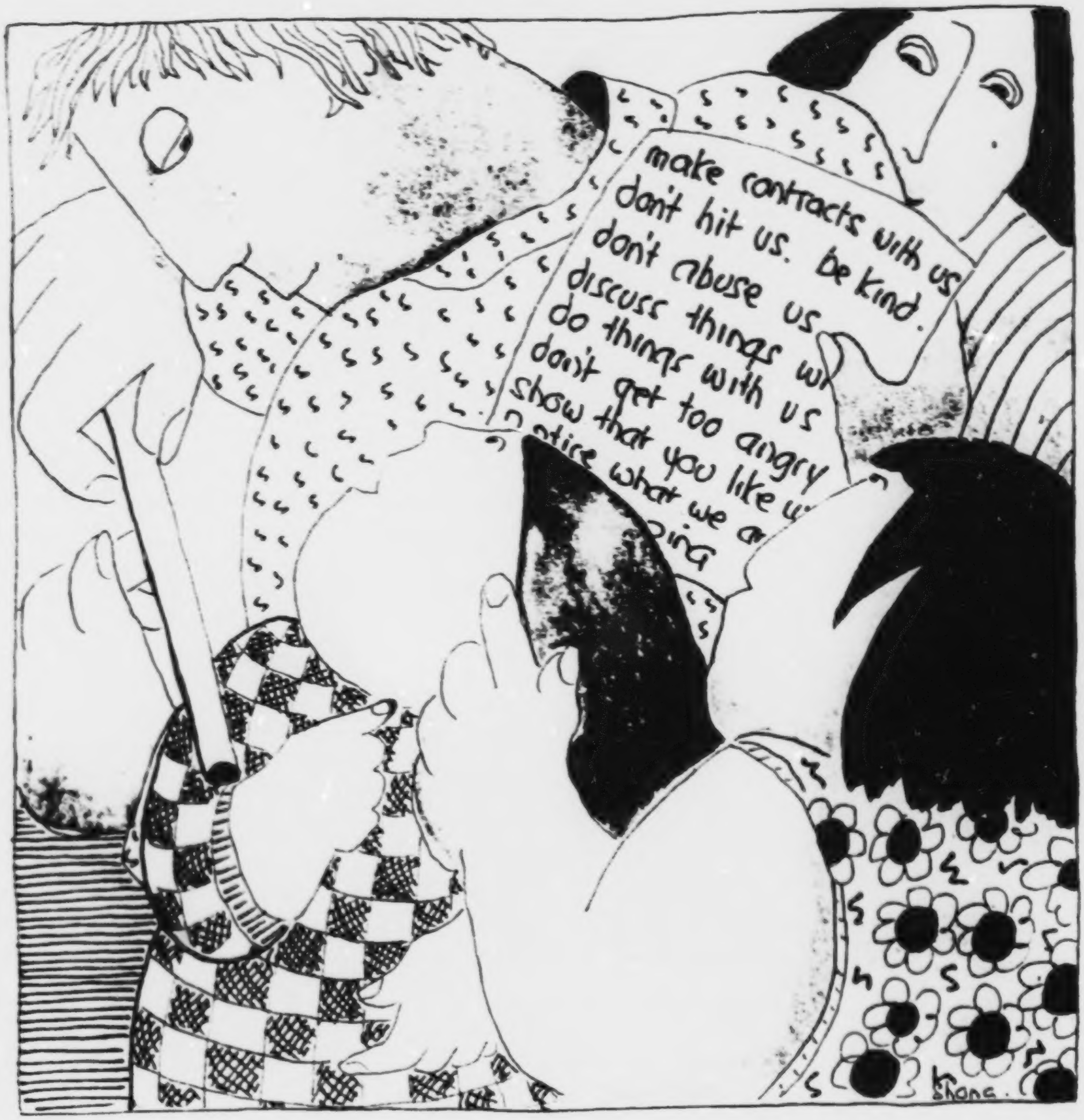
Suggestions from children on how to help us behave

Beth Wood
Office of the Commissioner for Children


make contracts with us
don't hit us. be kind.
don't abuse us
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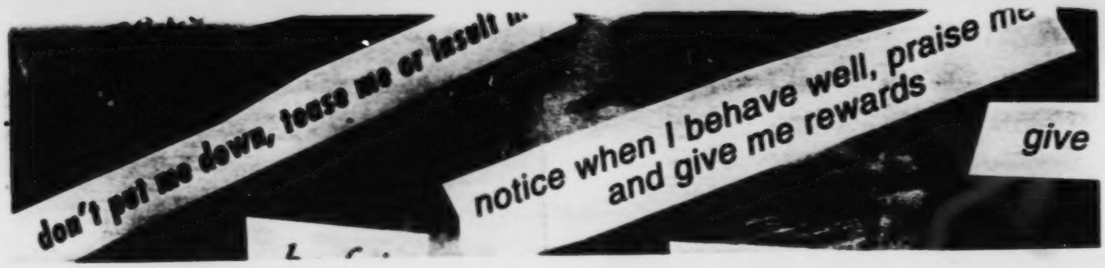
do things with us
don't get too angry
show that you like u
notice what we a
oing
Shona.

Shona McLean


don't put me down, tease me or insult m
notice when I behave well, praise me
and give me rewards
give

HISTORICALLY SOCIETIES have regarded the use of physical punishment of children as an appropriate way of achieving socialisation. Its use has been, and still is, justified as a necessary component in training children to behave well. Various authors have recorded historical attitudes towards child rearing and on the whole report a curious tendency towards brutality. In the debate about the use of physical punishment of children there are two opposing views and a middle ground containing the vast majority of adults who hit children not out of strong conviction about "breaking the will" but out of habit and lack of information about the fact that children can be raised well without their being hit. Unfortunately there is also a significant group to whom blind violence is an acceptable, perhaps even admirable, form of expressing anger and getting what is wanted from children.

Recent research from New Zealand and Australia

Hitting children is still a popular method of responding to childhood misdeeds or disobedience and of expressing adult anger towards children. Although research by Gay Maxwell in late 1993 found a change in New Zealanders' attitudes towards the use of the extreme forms of physical punishment, still 87 percent of parents reported believing that there are certain circumstances where it was acceptable for a parent to smack a child. Only 12 percent of parents believed that they should never physically punish their children. Most parents, 66 percent, endorsed smacking sometimes but did not agree with hitting or thrashing.

There was however a reported change in behaviour. In the 1993 study 30 percent of the parents reported never having physically punished their children at all, 59 percent reported having smacked but never hit or thrashed and only 11 percent reported hitting or thrashing their children. At the same time 77 percent reported explaining or discussing their children's misbehaviour with them. Verbal strategies are becoming the favoured ways of responding to misbehaviour.

These results are generally very similar with respect to both attitudes and behaviour to those reported by Wightman in South Australia in 1993. She reported that only 11 percent of a sample in South Australia disagreed with the use of physical punishment and that only 3.6 percent of those surveyed had ever hit a child. One interesting finding in this study is that 24 percent of the respondents admitted feeling so angry when hitting or smacking a child that they were worried that they might get carried away and injure the child. Underlying these findings is a feeling of helplessness about disciplining children. Half of the parents in this study said that parents did not have enough information about different ways of disciplining children.

As the Australian findings suggest, the use of physical punishment can lead to quite severe physical abuse of children. It can also provide role models for children which will lead them to behave violently towards their peers as well as towards their own children in turn. A study of school children in Dunedin in 1992 demonstrated that those children who reported being physically disciplined by their parents were much more likely to report intending to use physical methods of disciplining their own children when they were parents.

Teachers and the law

The use of physical force in New Zealand schools is legislated against under the Education Act 1989 (139a), although in every state and territory in Australia the law makes an exception to the law of assault and allows parents, carers and teachers to use physical punishment provided no more than "reasonable force" is used. In South Australia, Australian Capital Territory and Victoria the use of corporal punishment by teachers breaches Education Department policy and a teacher in a government school could face disciplinary proceedings for hitting students. But that same teacher could still justify any caning or strapping as reasonable chastisement if faced with criminal charges or a civil claim for assault. All other states and territories allow corporal punishment in government schools (although some states have policies limiting its use). Corporal punishment is legal in all Australian independent schools.

Teachers as role models

The use of physical force with children can demonstrate violence and can place children at risk of injury. Habits tend to escalate — a small, occasional slap can soon become a stronger, more frequent blow. Parents tend to hit children either because they believe it is the only way to discipline them, or they do not know of any alternative, or out of habit.

Teachers hold an influential position in breaking the cycle of violence. They can encourage discussions with their classes, and can demonstrate and model the principles of decent human relationships contained in the child-

LISTEN TO ME AND RESPOND
don't expect me to do things I can't do
't scream at me - just te

you get things wrong

be sure I understand

don't get too angry

show me what you want

give me help when I need it

ren's suggestions. In their own classroom they can reinforce positive attitudes towards children's behaviour as well as attempt to influence parental behaviour.

Who better to ask about how to achieve "disciplined children" without using physical force than the recipients, or the potential recipients, the children themselves.

Children's views on promoting positive behaviour

Being committed to seeking the views of children and young people on matters which affect them, The Office of the Commissioner for Children conducted a study to ask children how they thought adults could most positively affect their behaviour.

Discussion groups were held with approximately 40 students, from 9 to 11 years old, at two Wellington schools (one primary and one intermediate). The aim of the sessions was to facilitate the children's expression of their ideas with the help of the teachers they knew well. I did not impose my ideas on them and chose to be very careful not to imply criticism of their parents or take a stand on the use of physical punishment. I did however want to encourage the children to value their ideas and I responded positively to their suggestions. The children came from a variety of cultures and backgrounds and there was remarkable consistency in what they said. They all displayed a serious, thoughtful and responsible attitude to the discussion and most contributed consistently.

Examples of "good behaviour" described by the students:
being polite   helping without being asked   thinking of others   not annoying   doing what you are told the first time   being co-operative   working productively   listening and not interrupting   cleaning up your own mess   respecting other people's opinions   having faith in people   forgiving   being friendly   showing respect   not saying "bad" things   not tricking the teacher   not giving parents a hard time   helping parents   sharing   not fighting.

Examples of "bad" behaviour:
disobedience   talking over people   being lazy   fighting   breaking confidences   jumping on furniture   refusing to do chores   being rude   not doing homework   being bossy   talking back   using bad language   pestering   destroying things   putting people down   ignoring   hitting   stealing   drug dealing   swearing   cheating   gangs   calling names   lighting fires   using weapons   drinking and driving   crime   throwing dangerous things   lying   not telling parents where you are going   graffiti   running away   going out without permission   nagging.

How can adults encourage children to behave well?
make contracts with us   don't hit us   be kind   don't abuse us   discuss things with us   let us cool down   make us feel important   notice what we are doing   give rewards for good behaviour   support us – don't put us down   praise us   be firm   have a sense of humour   do things with us   listen to us and give your opinion   don't speak harshly   keep calm   have fun with us   show us the right things to do   help us when we need help   be friendly, kind and helpful   be fair   don't be too strict   set a good example   listen to both sides of the story   compromise sometimes   trust us   know what we are doing   understand us   don't patronise us   show that you like us.

What should adults do when you misbehave?
tell us off or take things away if we do something wrong   talk about it   let us know what they don't like   keep us away from bad influences   keep us busy   punish us   take something away from us   explain what we have done wrong   show us how to do it next time   don't get too angry   make consequences we can learn from   tell us off but don't rub it in   warn us if what we have done is not serious   warn us – don't just tell us after the event   use a firm voice but don't scream at us   be fair.

As parents themselves the students thought they would:
give their children choices   just talk to them but not hit them [a few thought hitting was ok with very young children who could not understand words] *speak with authority   explain rules   use punishments that fit the behaviour for example give chores to do   make sure their children understand what they can do   encourage their children to be independent   reward their children if they did things right and take money away if they did something wrong   let them calm down before they talk to them   not push or pressure them   not force them to do activities they did not want to do   not expect too much of them for their age   give help when needed   be kind and generous   give them a good education   teach them not to abuse their children   set a good example   show they care   teach good manners   not teach them to steal   not let them hang out with street kids   guide them   not chuck them out on the streets   teach them right from wrong   encourage them   calm them down if they are angry   teach them to be honest   bribe them   give them some freedom   sometimes let them have their own way   spend time with them so they don't feel unwanted   teach them that doing chores is part of being in a family   treat all the children the same.*

talk things over with me

KEEP YOUR PROMISES

spend time with me

don't hit or abuse

notice me

Experiences which students thought influenced them to behave badly:

other children's behaviour particularly brothers' and sisters' being ignored being tired being teased being given a hard time by other people being yelled at, growled at or smacked being insulted particularly about your nationality some TV programmes having no friends people getting smart to you people setting poor examples.

Other suggestions:

don't hit it makes things worse grown-ups should keep out of trouble themselves and set a good example don't hit your children because they will hit their children don't abuse them physically or sexually don't teach them bad language teach them to do the right thing apologise to your children if you get things wrong be close to your children let them say what they feel let your children do something like karate which will teach them self respect and discipline and how to use physical strength in a good way keep your promises don't tease them or make them feel silly never use "When I was a kid".

Conclusion

A pamphlet was compiled using many of the ideas of primary and secondary school students about adult behaviour which positively affected their behaviour. There has been good feedback about the content and effectiveness of the pamphlet. The students' ideas were helpful and many displayed a considerable depth of understanding of themselves and parents as well as a clear sense of right and wrong. The exercise seeking the student's views arose as part of developing information for use with adults about alternatives to the use of physical punishment in managing children. The student's responses demonstrated attitudes many adults could do with reminding about.

The seven questions asked during this study could form the basis for discussions in classrooms with children of any age, and with parents.

- ☐ **Give me some examples of "being good" or "behaving well".**
- ☐ **And some examples of "behaving badly".**
- ☐ **I want to know more about the ways in which adults can encourage you to behave well. Can you give me some ideas?**
- ☐ **What should adults do when you misbehave? Think about things that are likely to make you behave better another time.**
- ☐ **When you grow up and become a parent what will you do to help your children behave well?**
- ☐ **What other things make children behave well or badly?**
- ☐ **We are going to make a pamphlet about young people's ideas about what makes them behave well so that adults can learn from them. Have you any other ideas?**

Notes

Beth Wood is a senior Advisory Officer, Office of the Commissioner for Children, Wellington.

The pamphlet which contains some of the students' suggestions from this study is:

> *Some suggestions on how to help us behave.* (1994). Wellington: Office of the Commissioner for Children, P O Box 12537, Wellington.

The Office of the Commissioner for Children is committed to promoting children's rights. In 1992 it began a campaign to raise awareness about the negative aspects of the use of physical force in discipline with children. The main aims of the campaign were:

- to promote children's rights,
- to inform parents and others that there are many effective forms of socialising and controlling children which do not involve the use of force,
- to draw attention to the fact that children learn from the models they witness and
- to share the view that attitudes about the use of force in discipline with children, and the use of violence generally to solve conflict, have been found to be factors contributing to the likelihood of physical abuse of children occurring.

In September of 1993 the Office of the Commissioner for Children launched the pamphlets *Think About It : Is Hitting Your Children a Good Idea?* and *Hitting Children is Unjust.* Further efforts from the Office of the Commissioner for Children to change attitudes the use of physical punishment with children have been directed at continuing to raise awareness on associated issues - to inform generally about the management of children without violence and to keep the issue alive.

In 1994 a set of pamphlets, stickers and posters, *Living in a no-hitting family* were aimed at re-inforcing the message of family non-violence. Children are very much part of the family and should not be hit, or hit each other either. A Teaching Resource Kit (*Living in a no-hitting family: children are family members too*) has been developed for use by community educators.

New Zealand attitudes towards the use of physical punishment are documented in:

> Maxwell, G.M. (1993). *Physical Punishment in the home in New Zealand.* Wellington: Office of the Commissioner for Children.

and

> Ritchie, J. & J. (1981). *Spare the Rod.* Allen and Unwin.

That physical disciplinary action can escalate into child abuse is documented in:

> Kadushin, A. & Martin, J. A. (1981). *Child abuse: An Interactional Event.* Colombia University Press.

The teaching resource kit is:

> Wood, B. (1994). *Living in a no-hitting family: Teaching resource kit.* Wellington: Office of the Commissioner for Children.

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> "...Don't hit your children because they will hit their children..."

set
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I Would Have Told Them If They'd Asked

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PUPILS' PERSPECTIVES ON SCHOOLING have received attention from at least three areas of research. School ethnographies carried out in the 1960s and 1970s examined children's experiences of classroom and school settings; psychologists working on motivational style have emphasised the importance of children's beliefs about how others perceive them; and researchers and practitioners working in North America have been active in developing programmes to prevent the emergence of behavioural and psychological problems in schools. There is a strongly held view that we cannot understand the origins or appropriateness of behaviour without understanding the context in which it occurs and the child's perception of this.

The interest in the child's perspective reflects recent developments in child care legislation and educational practice in New Zealand and Australia, as well as the United Kingdom, where this research was undertaken. For instance, within the British education system the importance of self-evaluation for the learning process has been emphasised by the introduction of Records of Achievement and pupil profiling.

The importance of the child's perspective has also been recognised in assessments of special educational needs. This article looks at the role of children in the assessment of their special needs and their perceptions of this process. We examine how children's perceptions of professional intentions can affect their behaviour in ways professionals may not recognise and finally we identify some of the constraints on professionals' ability to gain access to the child's perspective and take account of it.

(All names and identifying characteristics of the children have been changed).

Aims and scope of the research

The research involved an observational study of the formal assessment of 29 children (5-16 years old), referred to the Schools Psychological Service because of emotional and behavioural difficulties. Only four of the children were girls. This gender ratio is broadly consistent with another recent study of referrals for emotional and behavioural difficulties.

With the co-operation of clients and professionals the researchers observed the main parts of each child's assessment, including psychologists' interviews with children and parents, and medical examinations. Following the main observation sessions, separate interviews were held with each of the participants — professionals, parents and children — in order to explore their understanding of the purpose of the interview, what had taken place during it, and what outcomes were likely to ensue.

While this sample of 29 children elucidated children's perceptions at each stage in the assessment, it threw no light on their retrospective perceptions following completion of the process and their placement, usually in a residential school or special unit. As time did not permit a longitudinal study, we identified an additional retrospective sample of 18 children who had been placed in an off-site unit on account of behavioural problems or in a residential school specialising in emotional and behavioural difficulties. One off-site unit and two residential schools took part.

Children's perceptions of the assessment process

Despite departmental and professional advice about partnership with children, interviews with the children indicated that they rarely believed genuine attempts had been made to involve them in the assessment process, or even to encourage them to contribute. Many of these children appeared to be unaware how decisions had been reached. Nearly all of the children did remember being seen by a psychologist yet only three out of the eighteen were able to give any account of what the psychologist's role in the assessment had been. One of these children said of the psychologist's visit:

> That's how I found out I was dyslexic .... I saw him because I had learning problems. I saw him and he said I was dyslexic.

This child believed he had been seen by the psychologist "to help him [the psychologist] find out what was wrong with me" thus reinforcing his negative self-perception.

Children reported how anxieties they felt about the assessment were fuelled by the lack of information given to them about the purpose and outcomes of psychological and medical interviews. Frequently children felt they had little more than their own assumptions and beliefs to guide them in interpreting events.

In one case Tony gave a graphic account of his sense of powerlessness in the decision-making process. Before finally being placed in a residential special school for children with emotional and behavioural difficulties Tony had initially attended a mainstream school, had then been placed in a day special school before once more being moved back into the mainstream. Talking about his move back into mainstream he recalled:

> I left it [the day special school] because the teachers wanted to try me in a normal school. I went to a [mainstream] school one afternoon a week and was getting on well. I then went full-time to a different [mainstream] school and didn't get on at all .... I used to take a nice walk, which was 25 miles, round to the special school to see the kids and the teachers. I wish I'd never left there. I would have gone back if I'd had the chance. I would have told them if they'd asked.

In this account Tony offers a clear picture of how he saw his own needs and how he felt those needs to have been created, in part at least, as a result of decisions taken about him by adults. Yet from Tony's point of view, as with many of the children with whom we talked, the assessment procedures provided no opportunity for him to articulate an account of his needs and how those needs might be met in the future.

From the perspective of many of the children the decision to initiate an assessment was interpreted as itself implying the subordination of their account to that of those requesting the assessment, usually teachers but occasionally parents. Even though children might identify aspects of their own behaviour as probably unacceptable to other people there was evidence in every case to suggest that these children believed their problems in school had complex origins. The way the school dealt with children's problems was seen by them to be directly relevant to their present needs. Where outside professionals were seen to be responding to teachers' or parents' perceptions of the "problem" the assessment was often seen by children as part of their punishment. Nineteen of the children explicitly referred to the assessment in these terms.

Darren, for example, believed the assessment was taking place because his teachers were "saying I was the worst 1st year".

In discussing the circumstances of his case with a researcher Darren contrasted his teachers' views with his own account of the problems he faced in secondary school:

> There were a lot of people aggravating me because I wasn't bright. I was more or less the thickest in the class and I used to smash out at them .... I got on with the teachers bad. They just didn't know what my problems were .... I used to always get taken the rip out of and that was the trouble really. I never bothered to listen. I just sat there making jokes.

When seen by a psychologist, however, Darren made no reference to his feelings about the way the situation had deteriorated in school *even though the psychologist had tried to give him the opportunity to make his views known*. Far from providing him with an opportunity to put forward his point of view and have it given genuine consideration, Darren saw his referral to the psychologist as an expression of the power the school had over him and the means by which it was enforcing its view of the world on his life:

> There was nothing I could say really because they wouldn't have me back in school .... I didn't want to be away from my family and friends but he [the psychologist] put me here [residential school]. He's the one who got me sent away.

Darren believed there was nothing he could contribute to the assessment because he had no control over the issues that had been identified as important nor over the decisions that were being taken about his future.

Implications for professional practice

In at least 20 cases in our research there was evidence that the child's beliefs about the purpose of an assessment and about the role of professionals carrying it out had an effect upon the child's behaviour during the assessment. For instance, in the case of Stephen, a primary aged child whose assessment we observed, the psychologist stated the purpose of initiating formal assessment procedures to be that of identifying whether or not the child's needs would be better met in a residential school rather than the off-site behavioural unit he currently attended. Stephen's parents were unhappy about him being placed in a residential school and sought to influence the outcome of the assessment by having him accepted into a mainstream primary. When this occurred Stephen commented "now I can start being good".

Prior to this, his understanding had been that he was attending the behavioural unit because his behaviour was "bad" and there was nothing he could do about this. His removal from that unit meant to him that he was now able to reassert control over his behaviour and act according to the changed expectations he perceived others to have of him. His transition back into mainstream was a reasonably smooth one according to the teachers at his new school and the assessment was subsequently abandoned.

Other assessments we observed suggested how professionals may misinterpret behaviour when they are unaware of the child's understanding of the aims of the assessment. In turn their misinterpretations may be used to support recommendations that influence the eventual outcome of the assessment. The possibility for a breakdown of communication between a child and the professionals conducting the assessment is clearly illustrated in Peter's case. Peter's assessment shows how interpersonal processes may lead to misconceptions about children's thinking on the part of professionals and vice versa.

On the evidence of personality testing, Peter's psychologist suspected that he might have a personality disorder. Following an interview between the psychologist and Peter (who presented as "unco-operative" and "emotional") the psychologist argued that this behaviour confirmed his hypothesis:

> He's very introverted with a high level of neuroticism and a range of features that indicate he is specifically depressed ... a reduction of interest ... one could almost say he showed no emotion. "You do what you like mate, I'm not changing."

These observations were used by the psychologist to support the recommendation that Peter would benefit from placement in a residential school for children with emotional and behavioural difficulties.

During his interview with Peter, the psychologist reiterated his view that a residential school would be an appropriate placement:

> You know I'm thinking of an entirely different sort of school for you. A residential school where you don't come home until the holidays ... what do you think about that?

Peter's response was an emphatic "no". He was asked by the psychologist to elaborate upon this but remained silent. Our field note observation made at the time read:

> He is clearly upset at the talk of residential placement. His hands are clenched and he's holding back tears. This seems to be the first time during the interview ... that he's shown any sort of emotion or reaction to what's going on.

Peter's apparent lack of involvement in the interview until this stage is quite clearly open to a number of interpretations, one of which was advanced by the psychologist, i.e. a personality disorder. However, the child's own account of these interviews, given in a subsequent discussion with a researcher, suggested a quite different interpretation.

From Peter's own perspective the assessment threatened his chances of continuing to live with his family and as such was a source of considerable anxiety:

> The psychologist wants to send me away ... they're horrible there [residential schools]. You get put in straight-jackets if you're naughty. You get locked up and they have walls round to keep you in.

This anxiety about the role of the psychologist led Peter to distrust the psychologist's intentions and hence to his refusal to co-operate in the assessment. Thus, whilst the psychologist interpreted Peter's behaviour at interview in terms of his clinical diagnosis of a "personality disorder", the child's account of his behaviour during the interview was in terms of his expectations of the assessment process itself. Had the psychologist in this case been aware of Peter's own understanding of the purpose of the assessment and how this understanding had influenced his intentional behaviour this may or may not have affected his recommendation. What is significant, however, was that the psychologist was not aware of Peter's views. Consequently he was also unaware of his attempts to influence the outcome of the assessment.

Constraints on professionals

The disturbing behaviour of children may arise from tensions in the home or school, as well as from personality or constitutional "disorders". It would be fair to say that all the psychologists we talked to were sensitive to the influences on children's behaviour of the contexts in which the behaviour occurred. Nevertheless they often felt constrained to define the problem in terms of difficulties the child presented to others. These educational psychologists did not, and *could not*, simply assess the child. They were also responding to teachers' legitimate expectation of receiving a professional service. Referrals did not arise solely from a disinterested concern to establish if the child had special educational needs. Reasons for referral were also related to teachers' expectations of the outcome of the referral. These might include the acquisition of additional resources, the removal of the child from school, or a promise to act quickly if matters deteriorated in the future. Thus, in practice psychologists often felt constrained to negotiate a solution acceptable to the school because the school was also their "client". In this sense governmental departments which allocate scarce educational resources are also clients of the psychologists.

The power of the psychologist's different clients to realise their expectations of the assessment will vary from client to client. However, where conflict resolution is a major concern, the child may be at a particular disadvantage. This may be so even where, as was always the case in our study, the psychologist identifies the child as principal client. For example, Matthew, who was 15, was referred by his school for a formal assessment of his special educational needs after he had been indefinitely excluded because of his aggressive behaviour towards staff. In the psychologist's opinion Matthew's education was likely to suffer were he to be placed in a special school with its limited curriculum. Moreover, the psychologist was sympathetic to the child's account of the problems he had experienced in this school. Matthew wanted to be readmitted to his school and the psychologist agreed that this was desirable if ground rules could be established with the school for this.

> Because the school excluded Matthew pending psychological assessment I see the preparation of a statement as being a safety net. I do not want to send Matthew to a special school if possible because I believe he can cope with a normal curriculum. I want to say to his school that a statement is being prepared so I can recommend that he is readmitted with a behaviour contract.

For their part the school refused to entertain this proposal. As an alternative Matthew suggested a transfer to another mainstream school in the district. Again the psychologist felt this to be in Matthew's interests. However, after initial enquiries he became aware that Matthew's reputation had travelled and that no other school in the area was willing to take him in. In this circumstance the psychologist felt he had no real option but to recommend a special school placement for Matthew.

This case illustrates how psychologists' assessments may become focused on the child, either as "problem" or "victim", in consequence of the "need" to take account of the interests of other clients who have greater power to affect the outcome of the assessment procedures. Thus, even where, as in this case, the psychologist is aware of the child's wishes and is willing to take serious account of them in the assessment process, he/she may be prevented from doing so by the expectations other "clients" have of the appropriate outcome.

The need for extra training

Interview data from our study revealed that many psychologists and teachers would like to involve children in decision-making and would welcome initiatives leading to this being undertaken, although they were concerned about the difficulties of turning good intentions into good practice. Child self-report procedures in assessments are one way in which training may be appropriate. Others are suggested by the work of psychiatrists and psychologists who have been closely concerned with the question of how to listen to children. Recent work on records of achievement and pupil profiling is also of direct relevance here. What is clear from the experience of those authorities and schools where records of achievement have been successfully implemented is that the positive co-operation and involvement of teachers, pupils and parents, as well as the effectiveness of the schemes in terms of learning outcomes, has depended upon the existence of coherent programmes of in-service training. The importance demonstrated by this experience of combining coherent policy with well-informed practice is particularly relevant to attempts to maximise children's contributions to the assessment of special needs.

Notes

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Sally Tomlinson at the time of the research was a Professor in the Department of Educational Research, Lancaster University. She is now Professor of Education at Goldsmith's College, London.

This article is based on a seminar given at The New Zealand Council for Educational Research in 1991. Details of the research can be found in:

Galloway, D., Armstrong, D. & Tomlinson, S. (1994). *The Assessment of Special Educational Needs. Whose Problem?* London: Longman.

Armstrong, D. & Galloway, D. (1993). Assessing Special Educational Needs: The Child's Contribution. *British Educational Research Journal*, 19, (ii) 121-137.

Ethnographic studies of pupil's perspectives and schooling can be found in:

Hargreaves, D.H. (1967). *Social Relationships in a Secondary School*. London: Routledge and Kegan Paul.

Hargreaves, D., Hestor, S.K. & Mellor, F.J. (1975). *Deviance in Classrooms*. London: Routledge and Kegan Paul.

Lacey, C. (1967). *Hightown Grammar*. London: Routledge and Kegan Paul.

Willis, P. (1977). *Learning to Labour: How Working Class Kids Get Working Class Jobs*. Farnborough: Saxon House.

Woods, P. (1979). *The Divided School*. London: Routledge and Kegan Paul.

The importance of children's beliefs about how others perceive them is documented in:

Little, A.W. (1985). The child's understanding of the causes of academic success and failure: a case study of British school children. *British Journal of Educational Psychology*, 55, 11-23.

Rogers, C.G. (1982). The contribution of attributional theory to educational research. In C. Antaki and C. Brewin (Eds.) *Attributions and Psychological Change*. New York: Academic Press.

The North American programmes to prevent the emergence of behavioral problems in schools are detailed in:

Bond, L. & Compas, B. (Eds.). (1989). *Primary Prevention and Promotion in the Schools*. California, Newbury Park: Sage.

Trueba, H., Spindler, G. & Spindler, L. (Eds.). (1989). *What do Anthropologists Have to Say About Dropouts?* New York: Falmer.

Child self-report procedures have been developed in:

Gersch, I.S. (1987). Involving pupils in their own assessment. In T. Bowers (Ed.) *Special Educational Needs and Human Resource Management*. London: Croom Helm.

The question of "how to listen to children" is posed by:

Ravenette, A.T. (1977). Personal construct theory: an approach to the psychological investigation of children and young people. In D. Bannister (Ed.) *New Perspectives in Personal Construct Theory*. London: Academic Press.

Rutter, M. & Graham, P. (1968). The reliability and validity of the psychiatric assessment of the child: Interview with the child. *British Journal of Psychiatry*, 114, 565-579.

Tammivaara, J. & Enright, D.S. (1986). On eliciting information: dialogues with child informants. *Anthropology and Education Quarterly*, 17, 218-238.

The effectiveness of schools with records of achievement is documented in:

Garforth, D. (1986). Instituting records of achievement at County level: The Dorset/Southern Regional Examinations Board Assessment and Profiling Project. In P. Broadfoot (Ed.) *Profiles and Records of Achievement: A Review of Issues and Practices*. London: Holt, Rinehart and Winston.

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The dynamics
OF INFORMATION PROBLEM SOLVING

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IN NEW ZEALAND educators expect library use to contribute to learning in three key ways: through the practice of resource-based learning, the development of students' confidence and independence in reading, and the acquisition and use of information skills. This paper looks at the relationship between library use and learning in terms of students' thinking and problem-solving during independent research.

Answering questions or asking questions?

The context in which study skills have previously been examined often involves text search and processing by students who have been provided with materials known to contain the answers to questions set by the researchers. In contrast, students asked to complete project assignments independently must often frame their own questions, or interpret those of others, and locate appropriate materials in a variety of library settings. There is no guarantee that the information they need is actually in the books they find, nor is there a guarantee that the materials match their reading abilities and existing levels of topic knowledge.

Redefining library and study skills

Very little research has attended to the information gathering or library skills portion of research tasks set for children, particularly from the viewpoint of the young learners themselves. Thus the challenges are not widely understood and the learning that takes place in that phase is often overlooked. When one looks at the cognitive aspects of information retrieval tasks, however, particularly from the viewpoint of the learners themselves, two characteristics stand out.

Firstly, the task of identifying and defining a need to seek information and following right through to satisfaction of that need, cannot logically be separated into discrete entities labelled library and study skills. Rather it is a single, continuous process within which one can identify interactive phases. It is generally agreed that those phases can be described in terms of the following sub-tasks:

1. Identification of the need for information and articulation of that need;
2. Formulation of appropriate questions;
3. Location of information sources;
4. Evaluation of those sources;
5. Extraction of relevant information and
6. Processing and, if necessary, presenting the information to others.

(Generally speaking, the term *library skills* is used to describe activities in phase three above, while *study skills* tend to be packed into five and six.)

The second characteristic evident from observing children is that independent information retrieval and use demands sophisticated thinking skills and the flexible co-ordination of many areas of knowledge. It is essentially a problem-solving situation in which the learner (of any age) must monitor progress on the overall problem while solving many sub-problems (some of which are inherent in library systems and the resources they hold). The solutions reached at any point determine which phase of the information handling process will follow and influence behaviour during that phase. Thus each of the phases identified implies a complex combination of cognitive skills. In addition, to be an efficient information problem solver, the learner must reflect on the outcome of strategies being developed or applied, revise and regulate them carefully and in general engage in the higher order thinking skills that contribute to metacognitive activity.

The context of this study

The study reported here centres on the thinking and perceptions of 23 form one students (aged 11-12 years) engaged in the opening stages of a project assignment on the topic of birds. (All names and identifying characteristics of the children have been changed). The children were observed individually as they thought aloud and discussed their successes and difficulties as they worked in a school library to identify some questions and relevant information. Their efforts were recorded on video tape and as the children viewed their own tapes, they were asked further questions for clarification. The interview climate was one in which the students saw themselves as experts showing the researcher how things are really done when no conferencing or other teacher support is available.

The researcher's purpose was to focus on the difficulties of retrieving and using several information sources, together with elements of metacognition: What knowledge did form one students have of themselves as learners? What did they think was involved in information problem-solving tasks like project assignments? What did they understand of library systems and books? and What did they know of the demands of producing a project report for assessment? A further set of questions concerned their knowledge of how these variables interacted and whether form one students could adjust their behaviours in light of these.

Not surprisingly, there were large gaps in students' knowledge on these levels, but some students made some extremely insightful comments, and across the group, a picture emerges which could be used to guide teachers in understanding their own, as well as their students', attempts at information problem solving.

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Table 1: *Summary of findings*

Research findings	Implications for teaching	Classroom activities
Students have their own ideas about what's involved in information problem solving tasks.	Teachers need to build on the ideas held and show how parts of the task influence each other.	Learning activities that focus on what has to be done next and what happens when something goes wrong. For example, "What does it mean when the book you want isn't on the shelf where you expected it to be?"
These ideas influence the form of the information they seek and how they go about the task.	Students need to acquire an understanding of the concept of information and how its organisation varies in different systems and resources.	Small group discussion about forms of information and different ways of organising it. Comparisons between children's views and those of teachers and librarians, for example, childrens' subject descriptors could be compared with those in NASH.
Students seeking information often don't know much about the topic and are not sure what parts of their existing knowledge is relevant.	An important part of teaching is to help students make links between existing knowledge and exploration of new knowledge.	Learning activities that help students identify what they know and what that means for what they have to find out. For example, self questioning could include "Does this add to what I know and is it important for the question I am trying to answer?"
Students have little appreciation of how phases of the information problem solving process interact.	Information problem solving demands more than library and study skills. The process of finding and using information needs to be explored as a coherent whole.	Focus on thinking underlying information retrieval and how different outcomes at each stage lead to different results and actions in later stages. For example, rephrase questions, identify different keywords and see whether they access more information in the contents or indexes of different books.
Students do not realise that the need for information is sometimes defined by gaps in their own knowledge *and* parameters of the assignment set by teachers.	To learn how to manage learning situations students may need to have the relationships between themselves as learners, the learning activities, the learning resources and the outcomes made explicit.	Learning activities that help students reflect on similarities and differences in learning outcomes they manage for themselves. For example, compare the ease of understanding books that assume different levels of prior knowledge.

What was found

Table 1 summarises the research findings, implications, and some suggested classroom activities.

Identifying a need for information

For project assignments, the boundaries of the need for information come from two major sources. The initial task instructions and the evaluation criteria made public by the teacher form one set of boundaries and the students' identification of gaps in their personal knowledge form another.

In this case, the children had been given a very poorly defined information problem (essentially they were simply asked to do a project on birds), yet few sought clarification of instructions or information concerning basic evaluation criteria. They did not appear to appreciate the relationship between instructions, selection and outcomes of learning activities, and evaluation of the end product. Their greatest level of concern was on the number and type of questions they were supposed to answer, but this drew comment from only five of twenty-three students. They wanted to know "Can all the questions be about one type of bird?" "Can I ask questions I already have the answers for?" "Can I do anything I like?"

Exploration of this point later revealed that students generally thought that projects should contain between three and eight questions. The major consideration here was the time available for the project rather than the depth and complexity of the answers to be given, although three students volunteered the assumption that information in the final project should extend the knowledge of the reader.

Only one student asked about the format of the report to be produced, the rest simply assumed that they knew what the teacher required. Learning certainly took place, but not necessarily what had been intended by the teacher. The implication is that teachers who make explicit the links between their expectations for task content, student selection of learning activities and the evaluation of the learning effort, will provide information essential to planning approaches to learning tasks.

Formulation of appropriate questions

Most students did not define the need for information in terms of gaps in their own knowledge until they tried to come up with questions. In terms of metacognitive knowledge, 12 students stated quite clearly that they found it difficult to think of questions and a further three said that it was easy only sometimes. Not all were sure why that might be so, but six students claimed that knowing something about the topic makes asking questions easier. Three of their peers, however, took the opposite view — the more you know, the harder it is to come up with questions.

Other factors included being given enough time to think; being interested in the topic; and the expected availability of the required information in books. for example, Grant said it was pretty difficult to think of questions and went on:

> You have to think about what questions are ... like are they going to be easy to find or hard to find ... or are they going to be able to be found in a library, things like that .... It's hard to find a good question that you know you'll be able to find answers for.

Kieran had a solution to this problem. Asked how you make sure it's going to be easy to find, he replied:

> It's got to be a wide question, and it's got to be an encyclopaedic sort of question, a book sort of question, like "What are the birds in New Zealand?" and it'll be easy to find.

This sort of assessment demonstrates a high level understanding of the implications of certain sorts of questions for the activity that is to follow, however, only three students voiced the connection. Such understanding will become even more important as the range of information sources available to children increases — each has its own characteristics and while information technology has a special attraction, the book on the shelf beside the computer may be the best source of information in some circumstances.

Asked how they thought of questions for the project, students rarely reported that they reviewed what was already known. Typically they responded by emphasising the unknown. For example, Peter said "I don't really think of what I know. I like to find out things that I don't know, so I know more."

In contrast, Jane said she "sort of" thought about things she already knew "but ... then I was trying to think of, yeah, I thought of what I knew already but then I thought, well I can't ask that question because I already know it!" She went on to say that the teacher says there is no point in asking things that you already know. One wonders whether this dictum restricted Jane's review of prior knowledge as that was seen as irrelevant.

Overall, despite previous project experiences in which thinking about existing knowledge was strongly supported, only five of twenty-three students provided definite evidence of spontaneously identifying specific gaps in their knowledge.

As other stages of the information retrieval process were examined it became clear that the decision to ask a particular question in a particular way influenced subsequent action. Typical questions included:

What kinds of birds are there? What do they eat?
What birds are near extinction? What are birds in danger of?
What is a bird? How do birds fly? Where do they live?

Location of information sources

When the form one students said that they were ready to look for some information, all were asked how they would go about the task. Their answers were highly similar and followed a simple rule: they would look in the catalogue, find a Dewey number and go to the shelves to get the book.

Children's understanding of library systems sometimes led them astray at this point. The problem centred on the relationship of the catalogue information to the location and number of books on the shelf. A few thought that there was one subject heading entry for each book (thus three cards equals three books), others thought that the number following the decimal point in the Dewey number indicated how many books there were.

For example, Tom's behaviour prompted the following exchange:

Int: Do you think there's only one book with 598.2 on it?

Tom: Yeah, there's likely to be. 'Cos they don't have many of the same number because if they do, you wouldn't know which book is the one. Say if they had two 598.2 instead of having a 2 after it, they'd put a different number.

This sort of expectation led to two levels of problems in carrying out a shelf search. Firstly, students often identified the first book located with the target Dewey number as "the book I was looking for". This eliminated the need for selection strategies and those associated with the evaluation of content. Secondly, when a few mis-shelved books were found, it made reasonable the assumption that the entire bird book collection consisted of three volumes, and having found them, further search would be futile.

Frequently, when a Dewey number was not located as expected on the shelf, students assumed the library did not have the book (although the catalogue listed a subject heading) or that someone had borrowed it. Few students seemed prepared to check their search strategy and indeed their "knowledge" of the system may have precluded this. For example, one student explicitly stated that a Dewey number refers to a single location in the library at which *all* books relating to a topic would be found. The difference between a concrete location and an abstract subject classification was not appreciated. A Dewey number, even in school libraries, may refer to the reference collection, audio visual materials and vertical files, and in the main collection, it can refer to both large and small books. Appropriate regulation of search strategies in this case depends on accurate knowledge of the intellectual and physical organisation of libraries.

Book selection and evaluation

When it came to this phase of information seeking, students expected a close relationship to exist between their questions and the books themselves. They seemed to expect titles to reflect content accurately or to match keywords from their questions. Searching for "New Zealand" in a title was efficient if the topic chosen for study was local fauna, but the girl specifically searching for "eat" was disappointed to find that "they don't write many books about what birds eat."

Again, the point is that choosing the right book is rarely the result of applying a single, simple rule. Students must be prepared to think around their topic and the ways in which authors may have parcelled up and described the information, especially where creative titles have been used in the hope of attracting interest.

Students were also surprised when the layout and language used in texts, particularly in indexes and contents, failed to match their conceptions of the information problem. For example, a boy seeking information on bird species found a book indexed by habitat and promptly assumed that it did not contain any relevant material.

In evaluating books in the library, reading was generally kept to a minimum. In all, eight students made reference to skim reading at some point in their selection of texts, but their interpretation of this term differed from that of adults.

For example, Chris, when asked what he meant by skim reading, simply replied, "Find the right places. When I start looking down here like this [running fingers quickly down text column] start looking where it was ... read every word when I find it, I do." Thus for several students skim reading meant locating the right place to start reading in depth.

Overall, the reactions of the students to book layout and language raised a suspicion that many approached this information retrieval task with the expectation of finding the exact answer to their questions in the exact format required. Books failing to meet that expectation were often rejected, even when, in the eyes of the interviewer, they provided a great deal of relevant information. The children did not seem to be prepared to integrate information fragments from several sources to construct an answer. For example, Sue wanted to know where albatrosses live. Having found some relevant text, she said she could not get a "proper" answer for that question "because they live in all different places". Instead of including a range of places, her final report simply said "They live at sea."

Extraction of relevant information

The continuous nature of the information retrieval process was often shown. For example, as students read for selection this led them to reading for evaluation.

Peter provided an example as he read about falcons:

Int: Is that useful information?

> *Peter:* Yeah. From what I know at the moment it is... I thought they might eat rabbits and hares, but I wasn't sure about birds, that they eat birds and insects.

He repeated this kind of performance with regard to kakapo.

> *Int:* Does that add to the information you'd got?
>
> *Peter:* I don't know. I knew they were in Fiordland but I didn't know that they were on Stewart Island or Little Barrier. [Reads]. There's actually more birds than I thought there was. I thought there was only a few, but there's at least 35, maybe more.

The role of this kind of knowledge state assessment in directing information seeking was demonstrated by Kieran, who had in one book identified grey teal as the species of interest. When he failed to locate it quickly in the next book, he suddenly returned to the first (left open on the floor) because "it might be a rare bird or something — I don't know if it is or not". This information had to be extracted from the first book to determine which chapter should be searched in the second. He also returned to that first book sometime later as he encountered a book on the shelf titled *Small Birds*. This time he searched the text for details of the bird's size and on finding that it was 52 cm long, held his hands apart and concluded "That's pretty big for a bird!" *Small Birds* was therefore not taken off the shelf.

These examples expose the learning that takes place during information retrieval and the dynamic nature that knowledge state assessment can assume. They were, for this sample of students, unusual in their depth of discussion. Some students failed to find materials that would support this kind of activity, others seemed to be more concerned with locating *anything* which could be used and may have had insufficient topic knowledge to prompt more dynamic action had they found appropriate materials.

Information problem solving tasks

The information explosion makes it imperative that students learn to locate, select, evaluate and integrate information from many sources. The students in this study illustrated the complexity of the thinking that underlies the initial stages of information problem solving at any age. Their actions demonstrate how identification of an information need influences what materials are sought and how they are selected and evaluated. The students' understanding of library organisation was seen to restrict their actions and the success of their mission.

Overall, it seemed that students had a simple rule for finding information — think of a question, identify its keywords, look up the subject index for a Dewey number, go to the shelves and find the answer in the exact form it is wanted. If any part of that sequence failed they often seemed surprised and confused. In the real world, information seeking takes a long time. It is characterised by blind alleys and false scents and answers often need to be constructed following critical consideration of the available information. Few of the children were prepared to construct answers by integrating information fragments or to reflect on the effectiveness of their search strategies and how they could be modified.

This project task made public a great deal of student decision making which suggests that similar tasks could be used to foster the development of higher order thinking. In other words, project assignments should be set with the purpose of promoting an understanding of thinking processes rather than for their product alone. The question is, how?

Conclusion

If we are to improve children's library research skills, we should make explicit the continuous, problem solving nature of the task and promote the notion that a single simple rule is not likely to be effective in all situations. A raft of strategies and the conditions which prompt their use should be made explicit and the interactive nature of the phases within the information problem solving process should be emphasised. This implies the need for teacher feedback and assessment that focuses on process and the development of reliable, flexible strategies that meet the demands of information systems, be they library or technology based.

While educators have to focus on the individual skills that make information problem solving successful, they need also to demonstrate how those skills are combined and interact, as well as how approaches are modified in light of particular features of information systems and books. This in itself will demand that teachers develop a much clearer idea of themselves as information users, that they reflect on what they actually do when resources do not meet their expectations or when they cannot be found easily and time is tight. Librarians and trained teacher-librarians have considerable knowledge to help every teacher improve their understanding of the information world in this way.

Libraries do indeed contribute to children's learning in terms of resource-based learning, the development of students' confidence and independence in reading, and the acquisition and use of information skills. Their potential to do so however, could be enhanced and related more strongly to educational theory if the thinking and learning underlying information problem-solving were given explicit attention throughout the entire process.

Notes

Dr Penny Moore is a lecturer in the Department of Library and Information Studies, Victoria University of Wellington.

Research for a doctoral thesis forms the basis of this article, which was adapted from:

> Moore, P. A. (1995). Information Problem Solving: A wider view of library skills. *Journal of Contemporary Educational Psychology*, 20, 1-31

which also contains greater detail on the metacognitive functioning of form one students during information problem solving tasks.

Further information concerning the ways in which libraries contribute to learning can be found in:

> Chalmers, A. & Sivfield, H. (1993). *Contributions to Learning: Libraries and New Zealand Schools*. Wellington: Research Unit, National Library of New Zealand.

The students' perceptions of library systems and books were discussed in an earlier issue of *set*:

> Moore, P. A. & St. George, A. (1989). The information quest. *set* No. 2, Item 9.

The format of Table 1 was previously used by Beverley Bell in the Learning in Science Project Course Components 1990, Working Paper 407, University of Waikato. NASH in the Table stands for Numerical and Alphabetical Subject Headings, made available to all schools to guide classification of library materials.

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set
number two 1995

What Do Students Think "Learning" is and How Do they Do it?

A CROSS-CULTURAL COMPARISON

Nola Purdie
The University of Western Australia

MORE AND MORE OVERSEAS STUDENTS, particularly from south-east Asian countries, are being educated in Australian and New Zealand schools. Differences in schooling and cultural traditions lead to different understandings of what learning actually is and to the strategies students use to regulate their own learning. If educators are to cater successfully for students from other cultures it is important to develop a better understanding of what these students think learning is and how they go about doing it.

Stereotypes

A major finding of the study described here confirms the stereotypical view of Japanese students as "rote memorisers". However, it is the Australian students who are found to have a narrow, school-based view of learning. The Japanese students view learning from a much broader perspective. For them, learning is not only related to what happens at school; it is seen also as a lifelong, experiential process leading to personal fulfilment.

The study

Students in their final two years of schooling (16 to 18 year olds) from five schools in Australia and five schools in Japan were used as subjects for this study. The 248 Australian students came from a range of school "types" in the Perth metropolitan area—state and private, single sex and co-educational; as did the 215 Japanese students who came from schools in Tokyo and Shizuoka.

A *Student Learning Survey*, consisting of ten open-ended questions, was used to elicit responses from students about the learning strategies they use and the conceptions of learning they hold. The first eight questions were concerned with students' learning strategies, and were based on The Self-Regulated Learning Interview Schedule (SRLIS) developed by Zimmerman and Martinez-Pons in 1986. Students were presented with eight different vignettes in which a range of typical learning contexts are described (for example, in class, at home, preparing for tests, when poorly motivated). They were asked to indicate which strategies they would use to assist learning in such situations. Students could choose from 14 categories of self-regulated learning strategies (self-evaluation; organising and transforming; goal setting and planning; seeking information; keeping records and monitoring; environmental structuring; self-consequences; rehearsing and memorising; seeking peer, teacher or adult assistance; and reviewing tests, notes, and texts) and a 15th category ("other") which recorded non-self-regulated behaviour. As well as indicating the choice of strategies for particular contexts, students were asked to estimate the frequency with which they would use these strategies in similar situations (based on a 4-point scale from 1 = seldom to 4 = most of the time).

The final two questions of the *Student Learning Survey* were concerned with students' conceptions of learning. They were given the opportunity to express what they meant by "learning", what they meant when they said they had "learned" something, and they were encouraged to provide examples to illustrate.

Students' responses to the first eight questions were coded according to the fourteen categories proposed by Zimmerman and Martinez-Pons (1986) (See Table 1). Students usually described each strategy they used in one sentence, and for each question the number of strategies mentioned varied considerably. Some students said that they did "nothing special" in some learning contexts, while other students listed up to nine things that they did. The strategy consistency method of scoring the coded strategies was used. This method weights each mention of a strategy by a student with the estimated frequency of its use (1 = Seldom, 2 = Occasionally, 3 = Frequently, and 4 = Most of the time). The score thus obtained was interpreted as a rating of *consistency* of use of that strategy.

Results

Nine clear categories of learning conception emerged from the analysis.

(1) *Learning as increasing one's knowledge*

This conception is quantitative in nature, referring to the accumulation or absorption of knowledge—the more, the better.

> ... when you're taught something or get some information which you didn't know about before

Students frequently referred to a dependence on other sources, such as teachers or books, for the acquisition of information.

> ... trying to get new knowledge through books or information from other people

As well as an increase in knowledge, there was often mention of an increase in ability or intelligence.

> ... if I actually soaked in the information being taught in class, and increased my ability, became more intelligent

(2) *Learning as memorising, reproducing, and studying*

Not infrequently, both the Australian and Japanese students in this study linked the processes of memorising and reproducing to that of studying. Although many students responded with a simple "learning is studying", for others, the act of studying was inseparable from learning and memorising. Hence:

> ... studying specific things and finding you can remember what you have been taught

Some students made reference to the "how" of memorisation, specifically mentioning use of the strategies of repetition and practise:

> ... something is retained by repetition and practise to be retrieved later

Other examples indicate that students are in some way actively involved in the process of learning. In contrast to the first conception where knowledge simply "soaks in", students who describe learning as belonging in this category speak of themselves as doing something.

> ... entering knowledge into my brain that I can recall whenever I feel the need

(3) *Learning as using knowledge for a variety of purposes*

In this conception, knowledge or skills gained are put to some use, either now or at some later stage. The application of knowledge is either for a specific and clearly identifiable purpose, or knowledge is seen as something that will be useful for some unspecified purpose in the future. It is different from the second conception in that application does not mean the exact reproduction of information for tests and exams. In fact, students generally did not refer to school contexts when describing learning as using knowledge. Responses were much vaguer, and there was frequently an emphasis on future aspirations for further study, or for a successful career.

> ... it will help me in the future ... to pass tests ... getting enough marks for University
>
> ... it's so I can have a stable life with sufficient income in the future

(4) *Learning as understanding*

Students who were classified as holding this conception of learning typically spoke of gaining (developing, grasping, discovering, finding, searching for) meaning. Their focus for understanding appeared often to be directly related to classroom learning, the test of that understanding sometimes being the ability to explain or teach subject matter to another person:

> ... you understand concepts well enough to be able to teach or explain it to someone else

Much of the literature on student learning highlights the supposed existence of a dichotomy between memorising and understanding. In this instance, the relationship between these two processes was not, on the whole, clearly differentiated by either the Australian or the Japanese students. More often than not, students spoke of learning as involving both processes:

> ... it's not good enough to learn things off by heart, you also have to understand

(5) *Learning as seeing something in a different way*

Only small numbers of students from either group indicated that they viewed learning in this way. When they did, the emphasis was on a changed way of thinking about something or about oneself. Personal opinions were formed and new ideas generated.

> ... I can look at life in new ways, relate to people and ideas in different ways

Sometimes there was almost a sense of moral improvement and/or social responsibility that came with new insights and ways of thinking:

> ... studying and learning from experience what to do and what not to do—what's right and what's wrong

(6) *Learning as personal fulfilment*

The main feature of this category is that learning was seen to lead to greater maturity, personal growth, or improvement, and this change sometimes led to a sense of empowerment.

> ... learning enables you to understand life and it improves you as a person
>
> ... what's important is what you do with the knowledge, whether you gained from the experience, grew as a person

Personal growth was sometimes associated with adulthood, maturity, or one's "humanness".

> ... to develop as a human, become an adult
>
> ... to grow in myself, to become more mature

The personal value of learning was not limited to the notion of change, however. As well as the concept of personal growth and development, there was often an associated expression of satisfaction or enjoyment; sometimes it was seen to be liberating.

> ... you should enjoy learning, it shouldn't be a burden
>
> ... your imagination, your creativity, your thoughts expand more widely, you have more freedom

(7) *Learning as a duty*

Only one Australian student expressed a conception of learning as a duty versus 14 Japanese students. Although not a large number, 14 was considered significant when seen in the light of the Japanese cultural emphasis on duty and responsibility, particularly to one's parents and teachers. Several students expressed an associated feeling of learning as being difficult but a responsibility, duty or obligation that one has both to oneself and to other people or society.

> ... although learning is sometimes difficult, it still must be done; it's important; I must do my best

(8) *Learning as a process not bound by time or context*

The *context* of learning was the main consideration of students in this conception. Learning was seen as not only related to school, but as occurring in a variety of everyday contexts. Students expressed the notion of learning through a variety of life experiences—during encounters with other people, through reading books, while travelling, and while at work. There is much real learning that occurs outside school. Learning continues throughout life; it is a gradual, continuous process.

> ... it starts from the very beginning (after birth) to the very last period of life (before death)
>
> ... it means not only to read from the course books, but also to know from our society how to live in the right way...we can know and learn from a small boy

(9) *Learning as developing social competence*

Once again, this minor category was almost exclusively the preserve of the Japanese students and perhaps reflected the Japanese emphasis on social competence as the most important identifier of intelligence. There was a focus on communication, human relationships, social and interpersonal skills—how one operates as a member of society or displays social common sense. As well, there was sometimes mention of helping other people, or displaying a social responsibility.

> ... learn so that I can become a good member of society and get on with other people easily
>
> ... it's when I know that I can communicate easily with other people, no matter whether they are young or old

Analysis

The significant differences in the conceptions of learning held by the two groups was analysed and reported in Table 1. The first two columns of the table show the percentage of students in each group who indicated that they held a particular conception of learning. Holding a conception at one level did not preclude a student from having a view of learning that included one or more of the other conceptions. Thus, for example, a student may have indicated that learning was both an increase in knowledge *and* personal fulfilment. Results of the analysis of the variance which was carried out on the result of the transformations in order to examine the relationships between the nine conception of learning dependent variables and the two groups of students, are shown in the last column of Table 1.

Table 1

Percent Of Students In Each Group Responding at Each Level of Conception of Learning, and Results of the Analysis of Variance

Conception	Australian (n = 242) %	Japanese (n = 194) %	F (df = 1,434)
1 Increasing knowledge	49.59	39.69	4.28*
2 Memorising and reproducing	59.92	26.29	55.21***
3 Using knowledge	31.41	28.35	.48
4 Understanding	58.26	23.71	59.39***
5 Seeing something in a different way	2.89	6.19	2.81
6 Personal fulfilment	4.96	34.55	73.97***
7 A duty	.41	7.22	15.47***
8 A process not bound by time or context	4.55	4.64	.002
9 Developing social competence	.41	6.19	12.71***

*$p < .05$; ***$p < .001$

Contrary to popular opinion, when asked what learning actually was, the Japanese students did not see learning primarily as a process of memorising and reproducing. In fact, it was the Australian students who most frequently mentioned this as a conception of learning. For the Japanese students, increasing knowledge (40 percent) was the most frequently mentioned conception, followed closely by a view of learning as personal fulfilment (35 percent). Memorising and reproducing, using knowledge for a variety of purposes, and understanding were seen to be essential components of learning by about one quarter of the sample of Japanese students (not necessarily the same students in each case). Other conceptions were mentioned by only small numbers of students.

For the Australian students, conceptions of learning appeared to be focused in the first four categories, with only very small percentages of students registering responses in the remaining categories. Memorising and reproducing (60 percent) and understanding (58 percent) were the two most frequently cited conceptions of learning. Fifty percent of students saw increasing knowledge as an essential component, and 31 percent mentioned using knowledge for a variety of purposes. The last five conceptions were considered by less than five percent of students as representing an aspect of learning.

The strategy consistency scores for the two groups are presented in Table 2, together with the results of the analysis of variance. When means for the two groups were rank ordered, "environmental structuring" and "self-evaluating" were amongst the three most frequently used of the strategies for both groups of students. For the Australian students, the other highly ranked strategy was "goal setting and planning", while for the Japanese students it was "rehearsing and memorising". The strategy of "reviewing tests and other work" did not feature highly for either group of students, and for the Japanese students, "keeping records" also seemed not to be important.

Table 2

Means (And Standard Deviations) of Strategy Consistency Scores for the Two Groups, and Results of the Analysis of Variance

Strategy	Consistency (SC) Australian n=248	Japanese n=215	F (DF=1,461)
1 Self-evaluating	3.19 (0.68)	3.16 (0.80)	.25
2 Organising and transforming	2.72 (1.30)	2.49 (1.44)	3.29
3 Goal-setting / planning	2.98 (1.08)	2.21 (1.67)	35.27***
4 Seeking information	1.48 (1.50)	1.82 (1.55)	5.91*
5 Keeping records	1.92 (1.79)	.67 (1.36)	69.27***
6 Environmental structuring	3.20 (0.90)	3.11 (0.82)	1.27
7 Using self-consequences	1.83 (1.75)	.83 (1.47)	42.65***
8 Rehearsing and memorising	2.16 (1.51)	3.15 (1.03)	65.40***
9 Seeking peer assistance	2.48 (1.38)	2.17 (1.51)	5.28*
10 Seeking teacher assistance	2.71 (0.97)	1.03 (1.45)	220.23***
11 Seeking adult assistance	1.27 (1.52)	.89 (1.42)	7.43
12 Reviewing notes	2.81 (1.41)	1.76 (1.74)	51.39***
13 Reviewing tests / work	.66 (1.39)	.10 (0.58)	30.47***
14 Reviewing textbooks	2.12 (1.58)	2.74 (1.37)	19.76***
TOTAL	31.52 (6.86)	26.13 (6.21)	77.65***
15 Other	2.95 (1.00)	3.03 (0.61)	1.02

* $p < .05$; ** $p < .01$; *** $p < .001$

The results from an analysis of variance revealed significant differences between the two groups in their use of 11 of the strategies. Of the 14 categories of strategic behaviour, the Japanese students scored significantly higher on three —"memorising", "seeking information", and "reviewing textbooks". The eight other significant differences favoured the Australian students. Overall, the Australian students reported significantly greater use of self-regulated learning strategies as indicated by the significantly higher total score.

Discussion

The results of this study indicate both clear differences between the Australian and the Japanese groups of students, while at the same time drawing attention to several marked similarities. Perhaps most noteworthy is the somewhat paradoxical finding that the Japanese students were far less likely than their Australian counterparts to view learning as memorising and reproducing; yet when asked to describe what they actually did in a number of different learning contexts, they indicated they do, indeed, use memorisation and rehearsal significantly more than the Australian students.

Australian educators have tended to dichotomise the processes of memorisation and understanding. In Confucian-based societies, however, studies have shown that the dividing line does not fall between memorisation and understanding, but between mechanical memorisation and memorisation in order to assist the development of meaning. The development of the ability to use imitation and repetition as an aid to learning is encouraged. This process, commonly labelled "rote learning", is frequently viewed by Western educators as an undesirable one because it is thought to signify a lack of deep thinking and understanding. Traditionally, however, repetition has been viewed by the Japanese as *a route to understanding*. Students are encouraged to learn from the traditional Confucian wisdom which recommends "Read it one hundred times, and understanding will follow spontaneously", and "Seeing knowledge without thinking is labour lost; thinking without seeing knowledge is perilous."

Recent research with students from several other Asian countries, where repetition and memorisation are learning strategies commonly adopted, has shown that the stereotypic Western view of the Asian learner as one who learns only by rote and who employs surface strategies and motives such that "deep" learning or real understanding does not occur is, indeed, inaccurate. When Asian students have been compared with students in Australian schools and universities, the reverse has been shown to be the case. It is the Australian students who are more likely to adopt a surface approach to learning.

Another major finding of this study is the predominantly school-based view of learning held by the Australian students in contrast to the much broader views of the Japanese students. In describing what they meant by learning, the Australian students described learning mostly in relation to studying or performing classroom learning tasks. Hence, the three most commonly held views were of learning as increasing knowledge, memorising and reproducing, and understanding (of subject content). For the Japanese students, on the other hand, learning was not confined to the classroom. More than one third of this group described learning as some form of personal fulfilment.

The least used strategy by both groups was that of "reviewing tests and other work". It is assumed that one of the purposes of using such a strategy is to capitalise on the feedback which is usually given by teachers on such work. On review of this work at some later date students are better able to assess their weaknesses and to make judgments about where to place their efforts in relation to their current knowledge or level of skills. When viewed in the light of the finding that feedback is one of the most powerful influences on student learning, this result should cause some concern to educators in both Australia and Japan.

Although willpower statements were categorised in this study as non-strategic "other", further investigation of this phenomenon is recommended. This is particularly so when considered in the light of the Japanese cultural emphasis on commitment to task and the ability to persevere. In schools, structured systems of student guidance (Seito Shido) are highly influential in the fostering of concentration ability, and persistence, and the urging of oneself to "keep going and try harder" may indeed be a strategic action on the part of a Japanese student. The value of self-talk in the regulation of one's own behaviour has long been recognised within Western psychology. The expression by an Australian student to "try harder" may be a self-instruction to do just that—to persist and not give up, to maintain commitment to task—rather than a vague expression serving no strategic purpose.

Notes

Nola Purdie is a PhD student and Research Assistant at the University of Western Australia. She recently returned to academia after 20 years' experience in secondary schools. Her major area of research is in Educational Psychology with a particular interest in issues relating to student learning, motivation, and self-concept.

This paper is adapted from the following conference paper, which was based on her Ph D research at the University of Western Australia:

Purdie, N. (1994, November). *What do students think learning is and how do they do it? A cross-cultural comparison.* Paper presented at the Annual Conference of the Australian Association for Research in Education, Newcastle, November 1994.

The AARE paper contains a good review of the literature concerning conceptions of learning; the relationships between learning conception, study strategy and learning outcome; the cross-cultural perspective on learning and the nature of knowledge; and the importance to academic achievement on self-regulation in learning.

Recent anecdotal evidence of a stereotypical Asian is found in:

Biggs, J. B. (1990, July). *Asian students' approaches to learning: Implications for teaching overseas students.* Keynote address presented at the Australasian Tertiary Skills and Language Conference, Queensland University of Technology, Queensland.

Watkins, D. (1993, February). *The Asian learner: A twin paradox.* Paper presented at the Enhancing th[illegible]uality of Teaching in Universities and Colleges Conference, [illegible]arleston, SC.

The modified Self-Regulated Interview Schedule used here was adopted from:

Zimmerman, B.J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology, 82*(1), 51-59.

Strategies indicating self-regulation in learning have been identified in:

Brown, A. (1987). Megacognition, executive control, self-regulation, and other more mysterious mechanisms. In F.W. Weinert & R.H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65-116). Hillsdale, NJ: Lawrence Erlbaum.

Corno, L. (1986). The metacognitive control components of self-regulated learning. *Contemporary Educational Psychology, 11*, 333-346.

The Japanese emphasis on social competence as an identifier of intelligence is expressed in:

Sternberg, R. L.,Conway, B. E., Ketron, J. L., & Bernstein, M. (1981). People's conception of intelligence. *Journal of Personality and Social Psychology, 41*(1), 37-55.

Studies with Confucian-based societies are documented in:

Marton, F., Dall'Alba, G., & Tse, L. K. (1993, August). *The paradox of the Chinese learner.* In 5th European Association for Research on Learning and Instruction, Aix en Provence.

The Japanese attitude towards repetition is reported in:

Hess, R.D., & Azuma, H. (1991). Cultural support for schooling. *Educational Researcher, 20*(9), 2-12.

Other comparisons of Asian and Australian students can be found in:

Biggs, J. (1991). Approaches to learning in secondary and tertiary students in Hong Kong: Some comparative studies. *Educational Research Journal, 6*, 27-39.

Kember, D., & Gow, L. (1991). *A challenge to the anecdotal stereotype of the Asian student. Studies in Higher Education, 16*(2), 117-128.

Watkins, D., Regmi, M., & Estilla, A. (1991). *The-Asian-as-a-rote-learner stereotype: Myth or reality. Educational Psychology, 11*(1), 21-34.

That feedback is a powerful influence on student learning is reported in :

Hattie, J. (1992). Measuring the effects of schooling. *Australian Journal of Education*, 36 (1), 5- 13.

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Using CD-ROM story books to encourage reading development

Dr Martyn Wild
Edith Cowan University

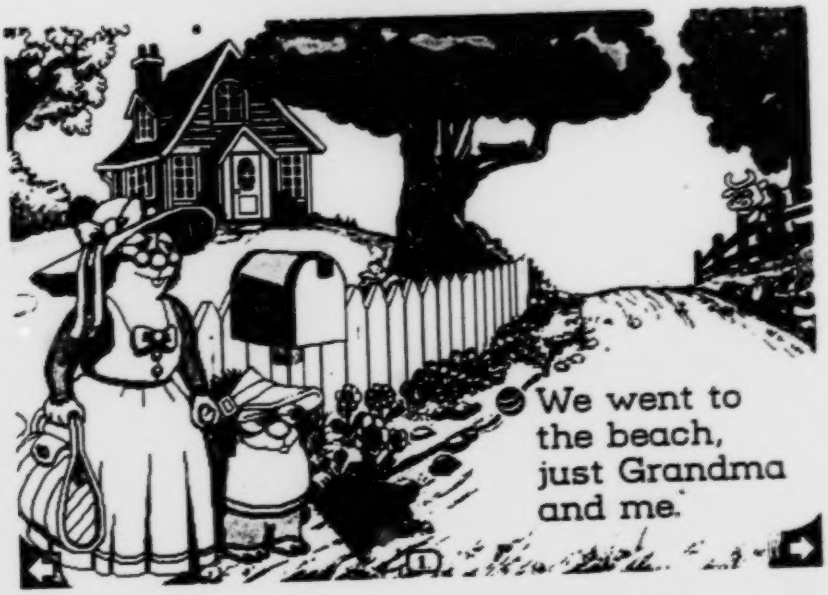


Figure 1. *Extract from Broderbund's* Just Grandma and Me

THE ADVENT OF CD-ROM and multimedia technologies has provided a new reading resource — the interactive "storybook". This paper presents initial findings from two investigations currently being conducted into the use of CD-ROM storybooks by staff and research students at Edith Cowan University. It describes the potential educational benefits of young children using storybooks; and describes how young children interact with storybooks and how their reading of them is likely to differ from their reading of traditional books. With rapid growth in the use of interactive storybooks, both in the home and school settings, these findings should be of interest to both teachers and parents.

Reading and computers

Using computers to help teach reading is a technique that has been applied since computers were first introduced into schools some 15-20 years ago. Computers are perceived as offering motivation for reluctant readers; for being well suited to breaking the reading act into component parts (a notion congruent with some reading process models); and as providing frequent feedback on progress. It has been suggested, however, that to date, the use of computer technology to help teach reading has largely concentrated upon word recognition skills and not upon higher order reading skills such as comprehension. As such, the use of computers has also failed to reflect recent trends towards holistic approaches to teaching reading, with the provision of quality children's literature to foster reading ability and interest.

Storybooks

The advent of CD-ROM and multimedia technology has been seen by some educators as providing the means to address such omissions. For example, such technology enables an integrated use of text, static and animated graphics, video, sound and music. There are various examples of CD-ROM interactive storybooks available from a range of publishers. In addition to the well-known examples from Broderbund (for example, *Just Grandma and Me; New Kid on the Block*), and Discis Books (for example, *Scary Poems for Rotten Kids; Moving Gives Me a Stomach Ache*), there are others available from different publishers. Currently, at least eight publishers offer CD-ROM story book titles. Discis' *Kids Can Read* Interactive Storybooks Series offer perhaps the best examples of this new reading medium.

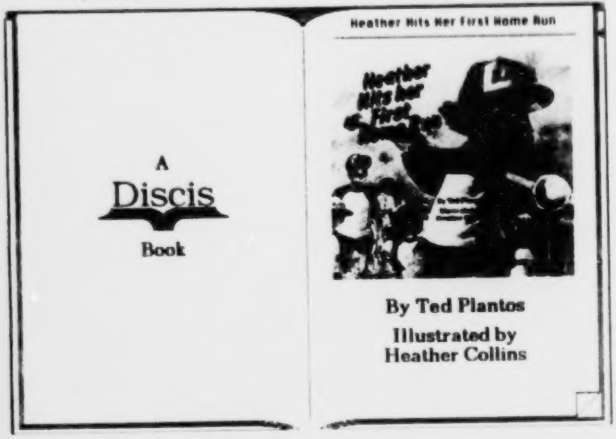
Storybooks are complete books made accessible on a computer, that provide help and support in the reading process on demand by an individual reader; in particular, they provide a range of features that facilitate the learning of meaning in text. For example, storybooks allow a reader to have the text read aloud by a human voice (either male or female), either as the complete text or selected parts of the text. They also encourage the exploring of the text through both fixed and animated graphics.

A storybook can be personalised by each reader according to their preferences. For example, customisation can specify which of the mouse options (that is, click, double-click, or press and hold) will access assistance for the reader in the pronunciation of words and syllables, in the provision of word definitions and in the use of graphic-word recognition. Also, a menu option ("Recall") tracks all words for which a reader requested assistance in any one session, providing a useful record keeping function for later reading diagnosis.

All these features of storybooks facilitate unconditional access to the type of assistance that might normally be expected in a one-to-one teacher-to-child learning situation. Furthermore, the learner is placed in the controlling position being able to explore text according to individual need and want.

Interactive storybooks use a model of interaction provided by traditional books — that is, reading is seen as a linear process, where readers progress from page to page and in one direction, according to the plot as it determined by the author. Storybooks could just as easily support a different kind of reading process, where readers follow a more dynamic pathway through the text, using hypermedia links to track and even construct their own story from the text offered. In this context, readers could repeatedly read the same storybook, following a different pathway through the storybook on each reading.

Figure 2. *Extract from Discis book,* Heather Hits Her First Home Run



A
Discis
Book

Heather Hits Her First Home Run

By Ted Plantos
Illustrated by
Heather Collins

An investigation into the benefits of storybooks

It would seem sensible to suggest that storybooks are useful resources in the classroom and that children who are exposed to them will benefit in some way. In order to identify these benefits two studies are currently being conducted by staff and graduate students at Edith Cowan University. The particular focus of the studies are the benefits of storybooks for young and reluctant readers, in terms of reading performance as well as reading attitude. For example, there are substantial numbers of children who can be classified as reluctant readers — children who, at an early age, demonstrate a reluctance to read traditional reading materials. If we are to improve these children's reading skills and performance, we must first find a way to help them develop a more positive attitude towards their reading.

The following questions guided our investigations:

1. What can be learnt about the reading strategies children apply when they use storybooks?
2. How do children interact with storybooks?
3. Does the use of storybooks lead to significant improvements in children's reading performance when compared with their reading of traditional books?
4. Does the use of storybooks as a strategy for teaching reading encourage reluctant readers to demonstrate more positive attitudes towards reading?
5. Are the attitudes developed by both reluctant and willing readers when they use storybooks more positive than those demonstrated towards their traditional reading material?

To explore these questions, we have put into place two parallel investigations: one that targets the wider use of storybooks over a relatively long period of time (64 children, over 8 weeks); and one that investigates the use of storybooks in greater depth (targeting only four children, over about 8 weeks). Resources for both investigations include 6 multimedia computers and 16 Discis storybooks and 8 Broderbund storybooks. The children are aged 7-8 years (year 3).

Initial results

- Those children who can be classified as able readers (that is, the majority of children in these studies) were initially motivated by the use of the storybooks but over time this motivation declined. Towards the end of the studies these children generally preferred to read traditional reading materials rather than electronic storybooks. They found that the process of reading storybooks was different from the process of reading paper books and the amount of distraction from storybooks (visual and audio) detracted from their enjoyment and their reading rhythm. In other words, it seems that willing and able readers, who have already "cracked the reading code", do not need the supports provided by the CD-ROM storybooks.

- All children classified as less-able readers preferred to read storybooks rather than traditional reading materials. They found reading easier when provided with the reading supports in the storybooks. Initially these children were motivated by the use of the computer itself though by the end of the study they were found to be motivated by the reading task (and, of course, the facilities in the storybooks that made that task easier and more under their own control).

- Although the attitudes towards reading storybooks improved for all the reluctant readers, this change of attitude only transferred to the reading of traditional materials (paper books) for some children. It may be that other reluctant readers needed more time to develop greater success and independence in their reading of storybooks before they could enjoy their reading of traditional materials.

- The attitudes of willing readers to the reading task have, as yet, shown no development — they have maintained a willingness to read and have continued to enjoy it as they did prior to these studies. In other words, the storybooks made no difference to them overall; except that they preferred to read traditional reading materials after their initial experience with CD-ROM storybooks.

- It seems that storybooks do have a beneficial effect on the reading performances of all children — in other words, the use of storybooks over time, does lead to children developing a larger vocabulary, greater understanding of word meanings and a greater comprehension of story plot, characters and events.

Storybooks and reading

It has been said "The best form of reading programme provides children with the opportunity to explore the widest range of books possible and to read them independently." To date, computer based developments for teaching reading by such holistic methods have been extremely limited. Furthermore, reading books aloud to children is recognised as a crucial component in total literacy development. However, in classroom settings the practice of reading aloud gives very little control of the learning process to the child — the child cannot easily stop the teacher and ask for the meaning or pronunciation of a word.

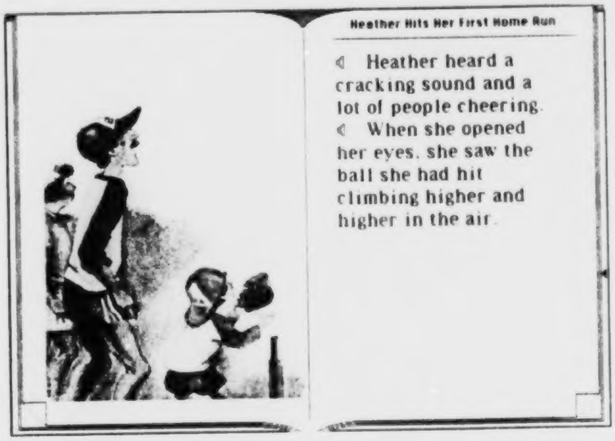
The use of storybooks perhaps provides a unique resource that best addresses these two points. In addition, storybooks provide other features that seem ideally placed to promote new ways for learners to interact with text and to help advance reading skills. For example, children can obtain feedback whenever they make a miscue (particularly one which interferes with their comprehension of the plot or characters) allowing them to get help with the pronunciation of a word or phrase, for example. Furthermore, the words and phrases of the storybook are highlighted when they are read by the computer, facilitating audio-visual recognition and thereby reducing the level of difficulty of the reading task. Also, feedback obtained from the computer is always non-judgmental (unlike some teachers' feedback). Finally, the control given to the child in controlling their interaction with the text allows them to reflect freely upon various aspects of their reading — for example, on the meanings of words.

Medium or message? How children react to storybooks

It is perhaps worthwhile to counsel caution about the likely effects of storybooks on young children's attitudes towards reading. From an earlier study, it was found that children of year 2 (6-7 years), much preferred reading books from Broderbund's *Living Book* series than reading traditional books — perhaps not a surprising finding, particularly when the multimedia experience was new to the children and introduced over a short time-span (3 weeks). However, what this earlier study failed to do was to distinguish between children's enjoyment of the task and their enjoyment of the technology. It is important to discover if children enjoy the task of reading more using the new media because, perhaps, that media makes that task itself more accessible. If the positive effect is carried by the media alone, then once that media is either removed or becomes the norm in children's experiences, the effect will become much less and perhaps even negligible. If, however, the reading task is made more enjoyable, then the effect is more likely to last.

This issue might be compared to the use of word processors in schools — initially children were motivated to write using a computer simply because it was a computer and its use was both a novelty and a means of doing something "special". But now that using computers for writing has become the norm (as is the case in some schools) we find that writing using the electronic medium is enjoyed not for its novelty value but because the task is made easier and more accessible with children often perceiving that word processors make them better writers. In other words, children form positive attitudes towards the writing task using the word processor rather than to the technology, *per se*.

Figure 3. *Extract from Discis book.* Heather Hits Her First Home Run



Heather Hits Her First Home Run

Heather heard a cracking sound and a lot of people cheering. When she opened her eyes, she saw the ball she had hit climbing higher and higher in the air.

Improving reading performance using storybooks

There are specific characteristics of storybooks that might be expected to impact favourably upon children's reading skills and performance. For example, the visual cues provided in storybooks might help children develop their comprehension of texts. When children read, they form a mental model of the story which they are reading and illustrations integrated within the text can help children enrich that model. For example, when single pictures (perhaps providing the opening scene of key parts of the story) are provided to the young reader, we know from research studies that they have an enormous impact on their understanding of plot, character and events by the time they have completed their reading of that story — they better comprehend the story.

However, not all storybooks provide the same type of illustrations or visual stimuli. For example, Broderbund's *Living Book* series are storybooks that provide multiple and disparate images which are often only incidentally relevant to the text. It is highly likely in this case, that the type of images provided will detract from children's comprehension of the story and interfere with their reading. This hypothesis is currently being tested with children of year 3 (7-8 years) and early findings tend to support it.

Also, the fact of reading from a screen might interfere with children's reading performance as well as their attitude towards electronic books — research into the physiological effects of reading using an electronic medium suggests that people get anxious and nervous when reading from computer screens for any length of time; and that most of us prefer to read from paper. Indeed, until the resolution of screens gets considerably better than it is currently, children are unlikely to show conscious or unconscious preference for reading from computer screens.

Conclusion

It would seem then, that some types of storybooks (not all) do have something to offer young children in their development of reading skills and attitudes. However, the full implications of the findings described above, as well as other findings that are yet to emerge from current investigations into the use of storybooks, are yet to be published. This paper draws attention to the potential effects of using CD-ROM storybooks with young children.

Notes

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This article is based on a paper presented at the Educational Computing Association of Western Australia State Conference, held in Mandurah, Western Australia, 2-3 September 1994:

> Wild, M. (1994). Of what use are CD-ROM interactive story-books as a resource for reading? In M. Wild & R. Oliver (Eds.). *Viewpoints 3: Selected papers from the ECAWA state conference for 1994* (pp. 7-16). Perth, WA: Educational Computing Association of Western Australia.

A second paper based on one particular attitudinal investigation which specifically describes research findings related to the effects of CD-ROM storybook use on reluctant readers' attitudes towards reading can be found in:

> Wild, M. (1994). *Reading with new technologies: How do CD-ROM storybooks affect young children's attitudes towards reading?* Paper presented at Australian Association for Research in Education Conference: Educational Research: Innovation and Practice, Newcastle, Australia, 27 November - 1 December, 1994.

The importance of motivation during reading is discussed in:

> Wallace, C. (1992). *Reading*. Oxford: Oxford University Press.

That reluctant readers associate books as boring is quoted from:

> Pilla, M. (1987). *Resource for middle grade reluctant readers. A guide for librarians.* Littleton, Colorado: Libraries Unlimited.

Breaking down the reading act into component parts is discussed in:

> Lesgold, A. M. (1983). A rationale for computer based reading instruction. In Wilkinson, A. (Ed). *Classroom computers and cognitive science.* New York: Academic Press.

Analysis of the use of current computer technology in the teaching of reading can be found in:

> Hladczuk, J. & Eller, W. (Eds). (1992). *The international handbook of reading education.* Westport: Greenwood Press.
>
> Miller, L. (1991). Look, the wind is blowing the pages: a review of Discis books. *Reflections in Canadian Literacy*, (9), 201-203.

and

> Miller, L., Blackstock, J. & Miller, R. (1994). An exploratory study into the use of CD-ROM storybooks. *Computers and Education*, (22), 1/2, 187-204.

The quote on "the best form of reading ..." is from:

> Holdaway, D. (1980). *Independence in reading.* New South Wales: Scholastic.

The value of reading aloud to children is documented in:

> Teale, W. (1981). Parents reading to their children: what we know and what we need to know. *Language Arts*, (58), 902-912.

The CD-ROM story books are available from Dataflow Computer Services, P O Box 202 Waterloo, NSW 2017 Australia.

The Discis Books used in this study included the following (suggested reading age in brackets):

☐ *The Tale of Peter Rabbit*, Beatrix Potter (3+).

☐ *Mud Puddles*, Robert Munsch (3+).

☐ *The Tale of Benjamin Bunny*, Beatrix Potter (4+).

☐ *Thomas' Snowsuit*, Robert Munsch (4+).

☐ *A Long Hard Day on the Ranch*, A. Nelson (4+).

☐ *Heather Hits her First Home Run*, T. Plantos (5+).

☐ *The Paper Bag Princess*, Robert Munsch (5+).

☐ *Moving Gives Me a Stomach Ache*, H. McKend (5+).

☐ *Scary Poems for Rotten Kids*, Sean O'Huigin (7+).

☐ *Cinderalla, the Original Fairy Tale* (8+).

☐ *Aesop's Fables* (9+).

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number two 1995

The Group Interview

ONE ASPECT OF SELECTING APPLIÇANTS FOR TEACHER EDUCATION

Jan Keenan and Jan Jones

Auckland College of Education

MANY SCHOOLS AND BOARDS OF TRUSTEES use interviews as part of their selection process for new teachers. Their concerns with making the procedure as fair and as effective as possible reflects the concerns of colleges of education where procedures for selecting applicants are under constant review. This article looks at a group interview procedure recently implemented at one college of education, taking particular notice of the opinions of the student applicants.

The general procedures that selectors can follow and the dilemmas faced by them while choosing applicants receives considerable attention in personnel research literature. For example, a review of selection practices in Britain showed that 81 percent of employers used some type of interview as part of the selection process. A "situational interview" has been shown to be more valid and reliable than traditional question/answer interviews, where scales are developed around critical incidents relating to particular desired and identified job-related behaviours and used in interviews. However, one critique of the concept of job analysis concludes, "It is only for very simple jobs that a designed set of abilities is necessary and sufficient for performance."

Educational researchers in the United States have pinpointed difficulties in defining any "generic" behaviours and skills which are easily transferred from one teaching situation to another.

Changes to the interview process

Traditionally applicants for teacher education at the Auckland College of Education attended an individual interview as part of an extensive selection process. Although some research shows that interviews alone are poor predictors of future success in employment, other education related research studies show that both students and selectors believe strongly in the necessity or efficacy of face to face meetings between selectors and applicants prior to selection. This is no longer the practice in some New Zealand colleges, where some students may be selected purely through written tests and/or academic and school records.

Interpersonal communication and selection decisions

Because much of teaching and learning is based around groups or individuals communicating effectively orally we wanted to maximise an opportunity for applicants to demonstrate how they interact with and communicate with peers as well as selectors by adapting our existing interview process.

Teachers must be able to communicate effectively orally. The nature of their work requires this. They must listen and respond effectively to parents, community and children. They must be able to exchange and reflect about ideas, ask questions, problem-solve and make consultative oral decisions. Moreover, new curriculum documents require that teachers provide learning experiences which will encourage children to develop similar skills to those they need themselves.

In order to give applicants a better opportunity to display their potential for developing these skills during their college education the group interview process is being developed. The Auckland College of Education primary division made the changes to selection practices during 1992-1994. The changes were based on the assumption that identifying and judging oral interpersonal communication skills is of considerable importance when selecting potential teachers. A further assumption was that a group interview with four applicants would give selectors better opportunities to assess oral interperşonal skills than the traditional individual interview (with only one applicant interviewed at a time).

The following criteria, set nationally for the selection of teacher applicants, were used during the interview process:

1. That applicants must show they can express ideas orally in a fluent manner.
2. That applicants should demonstrate what it means to "listen empathetically" in an interview.
3. That applicants can "respond appropriately in different situations".

The group interview as discussed in this article is only one part of a complex selection process used by the primary sector at Auckland College of Education.

The group interview

Applicants were grouped prior to the interview with consideration given to grouping those with similar interests, age and ethnicity. Although this often may not reflect the reality of the school environment, we aimed to make the interview a situation where the applicant was reasonably comfortable and might be more likely to reveal the best of themselves in a somewhat artificial and stressful context. Panellists who represented tangata whenua (the maori community), schools and principals (through a New Zealand Education Institute representative) parents (through a School Trustees Association representative) and Auckland College of Education staff met prior to the interview to become familiar with the procedures and purposes of the group interview. Applicants were advised of their group interview time and met briefly prior to the interview. The chairperson introduced the selection panel to applicants and explained how the interview process worked. The applicants were questioned for 40 - 45 minutes, each answering five questions. To aid reliability, some questions asked were the same for all applicants. However, one question for each applicant was individual, and applicants were also given a brief opportunity to discuss any individual matter of importance to them. These questions were asked in rotation with each applicant having the opportunity to answer first. The other applicants therefore were given time to reflect upon their question before answering, and could also add to or disagree with other applicants' answers. Panellists observed one particular applicant each to assess their interactions with the panel and the other three applicants, although all panellists contributed to a final marking grid score for each applicant.

Reviewing the group interview

Having designed and implemented a group interview we conducted research to check selectors' and applicants' views on the effectiveness of the changes. Panellists were interviewed after the first series of interviews to seek their opinions on the effectiveness of the new group interview process. They were asked if it was easier to look for indicators about interpersonal skills in the group interview or in a traditional individual interview. Despite some opposition to the concept of the change in the process before being involved, most of the panellists indicated their preference for the group interview over the individual interview (with some suggested changes).

We also questioned 24 student applicants to ascertain their opinions of the group interview; of how the new process might influence the demonstration of interpersonal skills; how the presence of other applicants influenced their answers; and if they had suggestions about what might make a selection process for teacher education students more effective from an applicant's point of view.

We interviewed an equal number of successful and unsuccessful candidates in order to note any significant differences of opinion between those who were selected and those who were not.

What the candidates thought

Before being told what the actual criteria for selection had been, candidates were asked for their perceptions about the purposes of the group interview.

Their replies were rather general in nature, along the lines that:

> It was to make us feel more comfortable
>
> It created a more informal atmosphere
>
> They wanted to see how we interacted together

Applicants were then asked to comment on the three main criteria for oral communication that had been used in the group interview. In no particular order, here are some of their reactions.

First criterion: *that applicants must show they can express ideas orally in a fluent mannner.*

All 24 applicants agreed that potential teachers needed to be orally fluent, and some were able to describe what they meant by oral fluency generally. However, one applicant questioned the meaning of "fluent"' asking if there were different ways of interpreting fluency. "Was it the quality of what was said, or just the way you said things?" Another applicant related the concept of oral fluency to the group interview and commented on the performance aspect of interviews:

> You have to talk clearly, not mumble, make sense, not look too nervous, not stammer — look interesting and convincing.

One significant finding was that almost all the successful applicants had prepared, or prepared more thoroughly, for their interviews than those who were unsuccessful. The successful applicants saw the interview as a performance which could be rehearsed.

All 24 candidates thought that it was possible to some degree to ascertain something about applicants' oral skills in a group interview. Four candidates proposed that the interview was only a test of how you spoke in a very formal situation — some people might be much more fluent in a less formal situation. One successful applicant said she was learning at college that a teacher's role wasn't just expounding in front of others like in the interview, but asking a lot of questions and being skilled at encouraging children to talk while teachers carefully listened. Two applicants noted that it was like teaching in that teachers get asked questions under pressure, but one commented that you didn't always need to know the answers as was probably expected in the interview. Two applicants suggested that all applicants should receive the questions prior to the interview to have the chance to prepare answers, like you would if making a speech. One said, "It's too short — its just a big speech you hold in your head for a short time, like an exam." Nine applicants felt that an individual rather than a group interview might be more of a test of oral fluency than a group interview.

Second criterion: *that applicants should demonstrate what it means to "to listen empathetically" in an interview.*

Discussion around this criterion showed how important it is for each selector to be clear about what a particular criterion might mean for that interview and confirm that the applicants understand this meaning. For instance, several applicants had difficulty expressing in their own words what "to listen empathetically" might mean in relation to the group interview. The dictionary defines empathy as "The ability to see into another person's mind and heart and so reach a full understanding of that person's thoughts, feelings or experiences." Thirteen applicants said it meant to listen sympathetically, but were unable to describe what that meant. Twenty-one applicants agreed listening carefully was an important life skill. However, 18 commented critically about the criterion in relation to the actual structure of the group interview, and how the criterion could therefore be accurately judged by panellists.

Comments from applicants included:

> You can nod and smile when the other person is answering the panel question. But you're busy thinking of your own answer. You're there to sell yourself, so you just sitt through what they say and try to think of something better. There's not much empathy about it. If they [the panellists] could tell, then I failed that one, because I didn't do that in the group interview.
>
> You don't get a chance to really talk to show you listen empathetically, that should happen in a one to one situation. You can always fake it at the time, but I was too stressed out in the interview, I listened but mostly to help myself . You're not really there for the other person.
>
> If you had to do something together and talk about it informally it might be easier to tell.

***Third criterion:** that applicants could "respond appropriately in different situations".*

Criticisms from the applicants when they were asked to analyse this criterion and its meaning for them were based on:

- The too general nature of the criterion, so that it appeared meaningless unless related to a specific context.
- The problem that even though one may respond appropriately in an interview, one might act quite differently in a teaching situation.
- The problem of knowing who should define what is an appropriate response in a particular situation (such as the group interview) and if more than single types of responses were appropriate.

Specific comments on how "responding appropriately in the group interview" might be demonstrated included:

> You show it through how you say (and what you say) in your answers.
>
> You know you have to sit there and wait until its your turn to answer the question. I didn't talk too long about myself so the others got a turn. You have to nod and smile a lot.
>
> You don't disagree with anyone too much, but you have to try and show you're sincere.

One Samoan applicant referred to his discomfort at describing his successful sporting achievements in front of peers.

One applicant reflected the problem for selectors of the one-off nature of selection procedures by saying:

> You'd need to see us in lots of situations to know, like us all talking together and seeing what we do when things are going wrong, or when we are with people we know well like our families. It would be impossible to judge in my opinion.

Peer interviews

In order to check how applicants thought they were affected by being interviewed alongside their peers we asked them, "Did the group interview enhance or inhibit you in demonstrating your interpersonal skills?"

Eighteen of the 24 applicants reported conflicting feelings in answer to this question, with only four thinking the procedure was entirely appropriate. In support of the procedure, applicants spoke about:

- the relaxing effect of not facing an ordeal alone, enabling them to reply more effectively; and
- the opportunity to prepare their answers while other applicants were answering the same question.

However, it was felt that having peers present prevented some applicants from speaking during the interview. Reasons given were:

- A loss of self-confidence when they perceived others were more verbally articulate than them. One candidate said she felt demoralised when another candidate gave a long detailed answer, talking knowledgably about aspects of child psychology learned at university.
- The strong social taboo of "selling" oneself in front of peers, or looking as if you were expressing views more palatable to authority figures than to their age group. One candidate expressed this succinctly. "I felt uncomfortable — you can't grease up to panellists in front of the others, you'd feel like a geek."
- The contradiction of the expectation that candidates should discuss answers co-operatively when in reality they were in a very competitive situation vying for positions at the college.

It was evident from the discussion with all the 24 successful and unsuccessful applicants that they felt the behaviour of most panellists, and the questions they asked, encouraged them to respond fully, and that this expectation was made clear at the beginning of the interview.

Suggestions from applicants for improving selection processes

No applicant was in favour of abandoning interviews, either individual or group. Fourteen applicants said that selection could never be a perfect process. Ten mentioned a variety of possible constraints to making changes such as allocation of money, resources and time, the sheer bulk of numbers who apply, community expectations and past practice.

Some applicants suggested a combination of group and individual time where they could speak in front of a panel both alone and in groups. Reasons given for spending time alone with the panel were that:

- They could be less inhibited in front of a panel when peers were not present.
- It would be fairer, for example, for those group members who might be inhibited due to feeling different from the other three members.
- There might be a better chance for panellists to explore special or individual characteristics of each applicant.
- The element of competitiveness might be less overt in an individual interview, reducing the level of stress which might inhibit oral performance.
- There would be less likelihood that applicants might perform badly because of their perception that other candidates' answers were better than theirs.

Some applicants suggested that since selection involved judgments about individuals, answers from applicants in individual interviews were more likely to be their own than in group interviews where any one answer could be a composite of what everyone else said.

Changes to the group interview

As a direct result of our research changes are being made to the group interview process. A pilot study of an amended group interview has been conducted with 100 graduate applicants for the 1993/1994 intake. The process differed from the one described in this study in the following ways:

- The four grouped applicants met and chatted informally 45 minutes prior to meeting the panel.
- A problem-solving exercise was used with applicants while panellists observed their discussion.
- A staff member introduced and explained the problem. Applicants were given individual time to read, reflect and make notes about possible solutions before the group discussion in front of panellists.
- Panellists were given a list of possible applicant behaviours relating to the oral criteria for assessment which might be identified during the interview.
- So that no applicant would be disadvantaged, they were all given details of the problem to be used in the problem-solving exercise before the interview.
- The interview was used both for problem-solving and for structured questions and answers by individuals.
- Successful and unsuccessful applicants were asked to subsequently evaluate their experience in similar ways to the research described above. This data is still being processed as part of an ongoing evaluation of selection procedures, and it is likely that further changes will occur to overall selection procedures.

Since this research was completed panellists have been instructed to recommend that if in their opinion an applicant has been disadvantaged in any way by the group experience, they should be re-interviewed individually.

Discussion

Reviewing the group interview process has increased our insight into applicant behaviour and has enabled us to take a critical look at what is or is not possible when selecting applicants. We believe we have provided a forum for discussion about applicant selection which will help schools and their communities as they reflect on their responsibilities in selecting staff.

Part of the value of discussing new processes is that both selectors and applicants may more fully appreciate the complexity of selecting potential teachers. Selectors may become more aware of the enormous number of variables which can influence what makes a teacher effective over time. Everyone involved in the interview process may become more aware of what can and cannot be done when making judgments about whom to select.

Notes

Jan Keenan is a lecturer at Auckland College of Education.

Jan Jones is also a lecturer at Auckland College of Education and is the Recruitment and Selection Co-ordinator.

The research described in this article is part of Jan Keenan's thesis towards her Masters in Adult Education, 1993-1994.

The problem-solving exercise used in subsequent group interviews was designed by M. Cameron, lecuturer at the Auckland College of Education.

A review of selection practices in Britain and Canada include:

Makin, P. & Robertson, I. (1986). Selecting the Best Selection Techniques *Personnel Management, November.*

The critique of the recent job analysis is from:

Schuler, H. (1989). Some Advantages and Problems of Job Analysis. In W. Smith, I. Robertson (Eds.), *Advances in Selections and Assessment* (pp31-42). UK: John Wiley & Sons.

Educational research from the United States showing the difficulty in defining generic behaviours and transferring skills between teaching situations include:

Corrigan, D.C., & Haberman, M. (1990). The Context of Teacher Education. In W.R. Houston (Ed.), *Handbook of Research on Teacher Education.* New York: MacMillan.

Stallings, J.A., & Kowalski, T. (1990). Research on Professional Development in Schools. In W. R. Houston (Ed.). *Handbook of Research on Teacher Education* (pp. 251-263). New York: MacMilan.

Zeichner, K.M., & Gore, J.M. (1990). Teacher Socialization. In W. R. Houston (Ed.), *Handbook of Research on Teacher Education* (pp. 251-263). New York: MacMilan.

That interviews alone are poor predictors of future success is referred to in:

Campion, M.A. Pursell, E.D., & Brown, B.K. (1992). Structured Interviewing: Raising the Psychometric Properties of the Employment Interview. *Personnel Psychology 41*, 25-43.

Jones, A., Herriot, P., Long, B., Prakely, R. (1991). Attempting to Improve the Validity of a Well Established Admission Centre. *Journal of Occupational Psychology, 64*, 1-21. (UK).

Makin (1986) see above.

The effectiveness of face to face meetings between selectors and applicants is reported in:

Schectman, Z., & Godfried, L. (1993). Assessing the Performance and Personal Traits of Teacher Education Students by a Group Assessment Procedure: A Study of Concurrent and Construct Validity. *Journal of Teacher Education, March/April 44* (NZ).

That it is difficult to problem solve with insufficient prior knowledge is reported in:

Chi, M.T.H., & Greeno, J.G. (1988). Cognitive Research Relevant to Education. *Annals of New York Academy of Sciences, 517*, 165-195.

Suggestions for further reading regarding selection practices include:

Arvey, R.D. , & Campion, J.E. (1982). The Employment Interview: A Summary of Recent Research. *Personnel Psychology, 35*, 281-322.

Batchelor, J.P. (1986). *Teacher Selection: A Delphi Investigation.* Unpublished thesis, Massey University, New Zealand.

Elliot J.G. (1973) *Improving Teacher Selection.* Unpublished thesis, University of Auckland, New Zealand.

Johnson, E.K., & Edwards, J.C. (1991, July). Current Practices in Admission Interviews at U.S. Medical Schools. *Academic Medicine, 66* (1).

Mitchell, L., & Wilson J. (1986/87). Suitable for Teaching: Applicants Views on Selection for Initial Teacher Training. *Scottish Educational Review.18-19*, 45 - 53.

Moyles, J.R., Schilling, M., Hislam,J., Cortazzi, M. (1987, May). Primary PGCE Recruitment: School - Based Interviews. *Research in Education*, 65 - 75. England: Manchester University Press.

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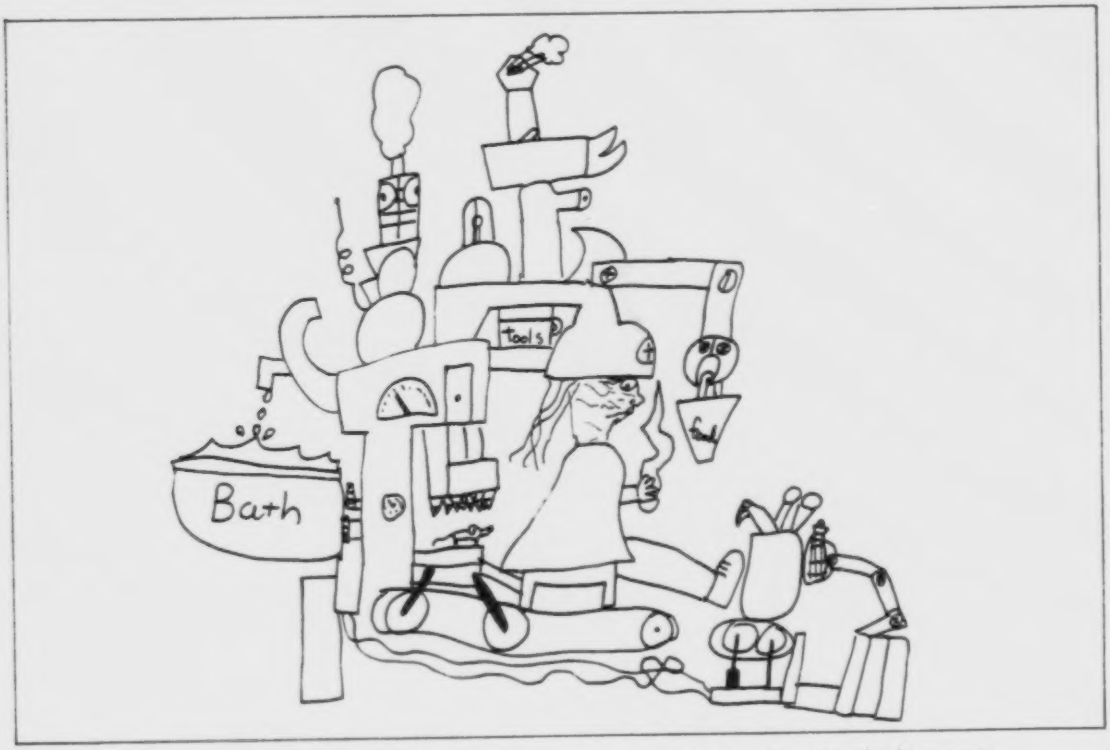
set
number two 1995

CHILDREN AS PROBLEM SOLVERS

Rowena Somogyváry
Wellington



Drawings by Tom Cottle, 7 years

IT HAS BEEN SAID *Too often we give children answers to remember rather than problems to solve.* New curriculums in Australia and New Zealand reflect the notion that unless we teach children how to identify and solve problems and how to think laterally, they will not survive satisfactorily in the 21st century.

Children's perceptions of our world are always simple, direct and profound. You can see that in their writing. In 1993 New Zealand was facing Parliamentary elections and the population was subjected to the usual barrage of rhetoric from the politicians. I believed in children's ability to see the essence of the issues confronting the country at that time, and to provide solutions.

It was this belief that led me to conduct creative writing sessions in over thirty primary schools around New Zealand. School principals, teachers and children responded generously and enthusiastically — their warmth renewed my hope that New Zealand might ultimately become a less traumatised society.

However, it was really New Zealand's children themselves who identified our country's problems. The credit for knowing and caring must go to them.

Ehara taku toa i te toa takitahi
Engari he toa takitini

The result of one's work and achievement
is the product of many hands.

Many hands joined together and collated the children's writing into a publication titled *Kiwi Kids Care*. The children are the authors. The illustrations, in inimitable style, are provided by seven year old Tom.

Readers of *set* are invited to share in the children's wisdom in the following excerpts from *Kiwi Kids Care*. You may feel inspired to have your children identify the problems in their country and to write, draw or talk over possible solutions.

How would you make children go to school everyday instead of playing truant?

By telling them they will learn how to read and they will get a nice lunch.

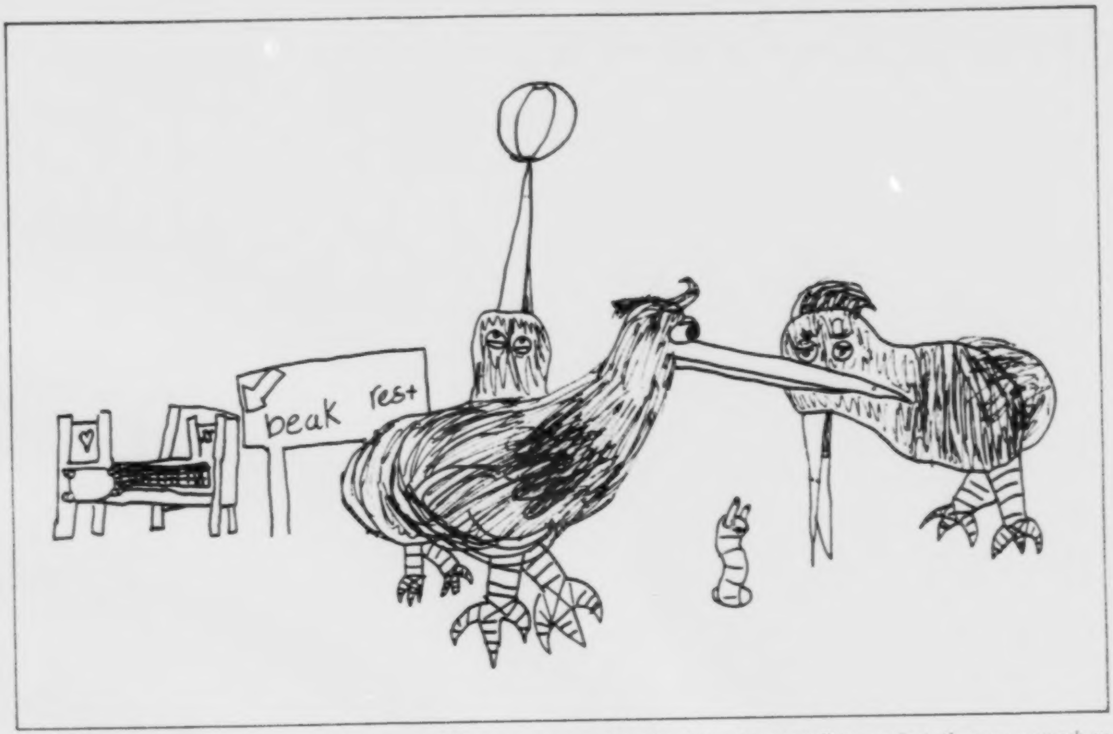
Justin, age 8.

Get video games in schools.

Alexander, age 9.

Tell them it is the only time they will see their friends for that week.

Jesse, age 10.



You could walk them to school. The teachers could have something exciting the next day so the kids would love to come to school.

Sian, age 10.

I would make interesting stuff in their playground and find interesting ways to do school work.

Charlotte, age 9.

Send them to icelation or teach them at home.

Kym, age 10.

How do you think we can help New Zealand's street kids?

I would round up all the children and put them in foster homes. If they don't all fit I shall have a huge home built which would have a school in it and all the resources a child needs. I would have a special machine that detects any stolen items or glue going in or out.

Philip, age 8.

I think we could get parents to go to a special class to learn to be a little stricter and not let their kids wander.

Samuel, age 9.

You have to be kind to the street kids because they miss their mum. Think about missing your mum.

Murali, age 8

Give street kids something good to do like help plant trees. It might not be cool for them but I reckon its a good idea.

Dominique, age 11.

What should parents do when their children are naughty?

You and your family could all have a meeting together and talk about your problems. You could stay away from them for a while or you could go to someone for advice so your family can get along with each other.

Carolyn, age 10.

I'd at least like them to talk to me first, then use a smack on the bum, not too extream on it. That way there would be no blood and guts.

Te Rama, age 8.

If I was naughty instead of my dad and mum hitting me I would like them to thretin me and if that doesn't work tell me to stop and then count to 3 and on [illegible] count of 3 if I haven't done it, then get the spatchuler and smac me on the bumb.

Heath, age 9.

If I was naughty, I would like my parents to confiscate my drawing pad, and not give it back until I deserved it.

Zara, age 9.

If children are naughty parents should make them sit down and do something quiet, but not watching TV. Instead of hitting or growling at them they can sit down with the parent and have some quiet time to talk it over. Give lots of hugs and forgive them.

Melanie, age 9.

I think parents should sit down with their children and talk about all their problems. And parents should look after their children and help them with school and things that the children have problems with.

Hayden, age 11

I think if people gave their kids treats when they are not naughty they might try and get more treats by being good.

Kyle, age 11

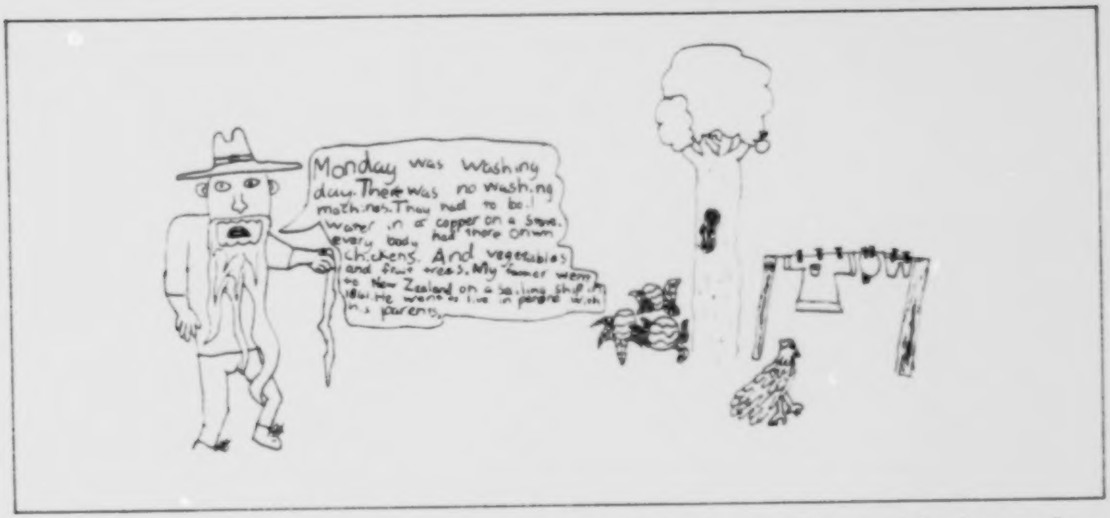
You can give them a special treat if they would stop it. Or you can send them somewhere that people can do something about it. Or just send them where they can't come back!

Sheralene, age 11

How can families best resolve their conflicts?

Say sorry if you hurt anybody. Put your shoes in their shoes and feel how they feel.

Karl, age 7


Monday was washing day. There was no washing mathines. They had to boil water in a copper on a stove. every body had there own chickens. And vegetables and fruit trees. My farmer went to New Zealand on a sailing ship in 1861. He went to live in [illegible] with his parents.

Stop fighting and make up. If you break something of someone elses, tell them.

Roderick, age 8.

If you fight with your brother or sister you should think why you did it. If you did it because you were angry, carm down and keep your cool and say sorry. If you still feel angry punch a pillow or kick a ball. Case Closed!

Nicholas, age 8.

Families should sit down and talk, go on holiday and forget about fighting.

Morgan, age 7.

Don't punch or hurt each other. Get a devors. Don't throw things around. Ignore each other.

Adrian, age 10.

Try to get along. If your parents say so just accept that you're not allowed.

Kylie, age 11.

Families should stick together all the time. I think parent(s) and child(ren) = family! They should sort out their problems not say ***you like peanut-butter. I hate it so now we have to get separated - divorced!***

Susie, age 10.

1. *Make up*
2. *Hug or Kiss*
3. *Play together*
4. *Forget about it*
5. *Talk together*
6. *Don't worry*

Ian, age 8.

Do you think you will have a job when you leave school?

No because I will probably be tired after all the axzames at collage and at unaverstey.

Sarah, age 9.

Older people would have died so all their jobs would go to the children my age.

Katrina, age 9.

Yes because being a housewife is a job. Even if I didn't have a real job, I'll still have a job as being a housewife.

Chorda, age 10.

No, I think I'll go to art school first.

Jeremy, age 10.

When I grow up I will be a funny person. There is always a job for a clown.

Brent, age 9.

Yes, I do think I'll get a job when I leave school because I know what I want to be.

Gina, age 11.

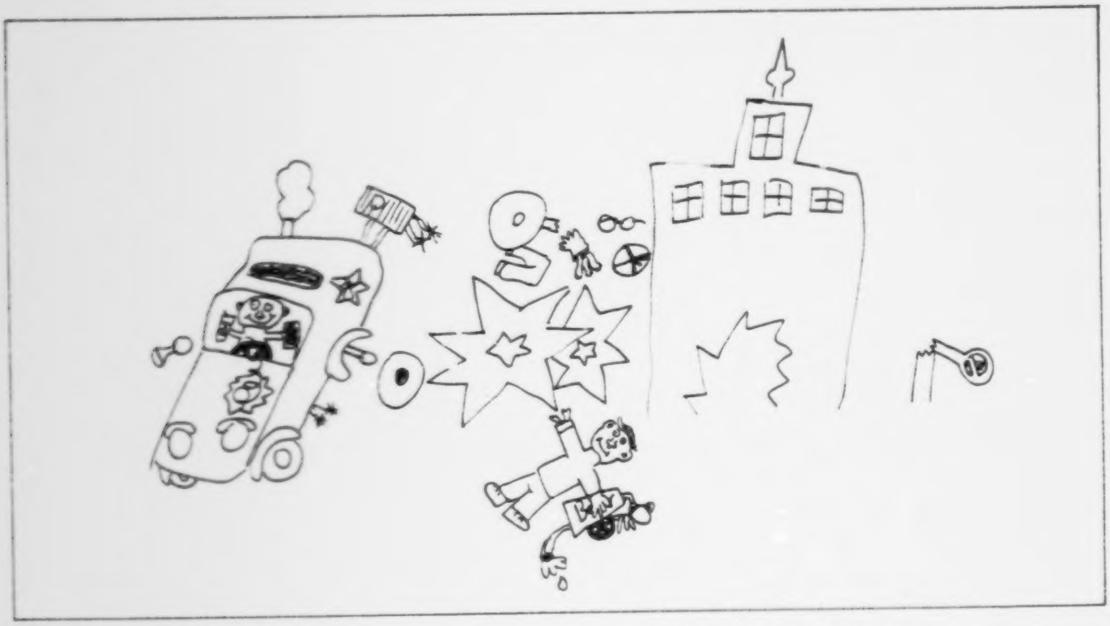
No I don't think I'll get a job when I leave school because now people don't have jobs.

Risha, age 11.

We need to address the question of unemployment in our country. How can we make more jobs for people?

To stop unemployment we shouldn't have so many machines and computers. You can't have a friendly chat with a computer.

Danielle, age 10.



Have more than one person to a job

Noel, age 8.

I think unemployment is a problem because people think negatively about themselves and don't think they can get jobs so they don't try. Maybe they should believe in themselves some more and they might go further.

Jessica, age 9.

I would create a fast-food or some other large business. I think we'd lose money for a year or so, but, with good slogans and using unemployed workers, the unemployment problem would go down.

Gavin, age 9.

Try to help people learn at school so they can be brainy enough to be what they want to be.

Aratemise, age 9.

What do you think the Government should do to make our schools better places? What would you like the Minister of Education to do?

The Government should always put money into worthwile things such as schools not themselves.

Felicity, age 11.

Maori kids and disabled kids should be treated like normal people and that means that they will get a better education.

Katie, age 10.

Keep our manners good.

Kathryn, age 7.

Keep the children in until they learn.

Liam, age 10.

- *Pay the teacher's more money so they are not so grumpy.*
- *When teaching us something teachers should make it straightforward instead of telling us things we do already know.*
- *Teachers should make the work slightly harder because it is too easy.*

Michael, age 11.

Better desks, more computers.

Stacey, age 11.

Make a new play ground for us big kids.

Bradleigh, age 9.

Invest more money into egerkashon.

Scott, age 9.

Notes

Rowena Somogyváry is a special educator in Wellington, New Zealand.

These extracts are from:

Somogyváry, R. (1993). *Kiwi Kids Care.* Wellington (P O Box 10502): Kiwi Kids Causes.

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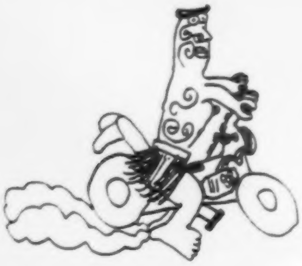

item 8

set
number two 1995

WHY SO MANY ADOLESCENT GIRLS WANT TO LOSE WEIGHT

Vivienne Adair and **Robyn Dixon**

Education Department
The University of Auckland

Adele Jackson

Why so many adolescent girls
want to lose **weight**

IN THE WESTERN WORLD there has been increasing concern recently about the eating behaviours of teenagers, especially girls. Magazines, newspapers and television documentaries have highlighted some of the most extreme cases which have resulted in conditions such as anorexia nervosa and bulimia. Although these cases are relatively rare with only about two percent of those girls who diet going on to develop these conditions, about two-thirds of all teenage girls will diet at some stage.

Of more direct concern to teachers are the numbers of girls who attempt to lose weight through dieting who would be categorised as having a disordered attitude to eating or who show disordered eating behaviour. Why do such high numbers of girls want to lose weight? Research has shown that there are a number of reasons. With puberty, and the associated emergence of sex characteristics, girls develop extra fat whereas boys develop muscle. This normal growth pattern not only changes body shape but also affects body weight. Studies have shown high levels of dissatisfaction with this "new" body-shape which is particularly emphasised in those girls who have serious investment in activities such as ballet, athletics, modelling and swimming. The current Western portrayal of an "ideal" figure as thin, which advertising infers as being a necessary state for being "happy" and "successful", combines to produce the dissatisfaction and negative body image. For many adolescents the difference between their actual body shape and the ideal body shape makes them want to lose weight either by skipping meals, counting calories, exercising, drinking lots of water or smoking cigarettes. In some cases, more extreme behaviour is used like fasting, crash-dieting, vomiting, or using laxatives, diet pills or fluid tablets.

> “...If her father dieted, a girl was more likely to crash diet...”

AN AUSTRALIAN STUDY was designed to find out why teenagers might want a different body size and what they thought the advantages of being thinner might be. Over 500 boys and girls aged between 13 and 17 were asked questions about being physically fit, being thinner and what they did to become thinner if they were trying to lose weight. In line with previous studies, the boys showed more satisfaction with their body than the girls. Over a third of the girls described themselves as being overweight when they were actually underweight or in the normal range whereas only one twentieth of boys did this.

These teenagers believed that being thinner would make them more healthy. As well, they said that being thinner would make them better looking, increase the number of friends they would have, affect how intelligent people would think they were and make it easier to get what they wanted. Both boys and girls thought that being thinner would affect their happiness. For girls being thinner meant they would be happier but boys said it would have the opposite effect. Except for those who were above the normal weight range the girls said that being thin was related to being fit.

One of the most interesting findings of this study was that very few of the teenagers said that their friends encouraged them to diet. However, nearly a fifth of the girls said that their parents did encourage them to diet. When the weights of these girls were examined, they were in the heavier weight group. The girls whose parents dieted or who were encouraged to diet by their parents were likely to diet more frequently.

AS PART OF A STAGE THREE COURSE at university during 1994 a study was set up using the questionnaire used in the Australian study, to ask some New Zealand pupils about their attitudes to dieting and exercise and the types of dieting they were involved in if they were trying to lose weight. The school chosen was a metropolitan co-educational secondary school which reflected the ethnic and economic population of the Auckland area. We chose to survey all third and fourth formers, which included 232 girls and 205 boys (aged 13–15 years).

Two university students were assigned to each class to supervise the data collection. One student helped the school pupils to complete the questionnaire while the other recorded the weight and height measurements. All the pupils had their weight and height measured in a way which kept the information private. However, some interesting behaviour occurred at this stage of the data collection. Several girls were reluctant to be weighed and a small number refused. Many of the girls made disparaging comments about their weight and their body shape or tried to get on the scales "lightly" to minimise the weight reading (whereas the boys tried to maximise their weight). In two classes where the university students supervising the weigh-in had "model" figures the school girls were so reluctant to have their weight recorded by those women that the university students swapped tasks and assisted in the written questionnaires instead. The weight and height information was used to calculate a Body Mass Index (BMI). According to the BMI, we found that 40 percent were classified as underweight, 44 percent as normal, 12 percent as overweight and 4 percent as obese or very obese.

LIKE THE AUSTRALIAN STUDY, we found that there were a number of girls (18 percent) who said that their parents encouraged them to diet and this group was the group which interested us. On average these girls had significantly higher BMI scores than the girls whose parents did not encourage them to diet but what is more important, exactly half of them were categorised as being in the normal BMI range (43 percent) or underweight (7 percent). This is cause for concern. If parents are encouraging girls who are developmentally normal to diet there is a possibility of triggering an eating disorder.

The girls who were encouraged to diet by their parents when compared with the rest of the girls believed that being thinner would make life better for them in a number of ways such as being happier, more socially acceptable and more successful.

One of the most interesting differences between the two groups of girls was in the dieting methods they reported using. Not only were the girls who were encouraged by their parents to diet likely to have used more dieting methods, they were also more likely to have used the more extreme methods including those described as pathological such as the use of laxatives. It is also interesting to note that almost a third of this group reported that they smoke cigarettes, which is twice as many as in the group of girls whose parents did not encourage dieting. Overall, girls who were encouraged to diet were more likely than those who had not been encouraged to have used seven of the eleven dieting methods mentioned at the beginning of this article. Another significant finding was the importance of the father in influencing a girl's behaviour. If he dieted his daughter was more likely to have skipped meals, crash dieted or counted calories in order to lose weight than those whose fathers did not diet. In contrast, if a mother dieted this did not appear to influence the daughter's dieting behaviour.

THIS STUDY has highlighted a number of issues which are important to consider. There is now good evidence that not only does the media portray unrealistic expectations of ideal body shapes, but some parents appear to encourage daughters to lose weight when it is not physically indicated. This indicates that it may not be sufficient to educate only the adolescent girls about healthy eating and about normal developmental trends in fat distribution and changing body shape. The involvement of parents — including fathers — may be essential to developing acceptance of body differences and interpreting the messages presented by commercial interests regarding "ideal" physical appearance.

The 1993 summer edition of *The New Zealand Coach* addressed the importance of sport coaches recognising risk behaviours (especially in young women) such as self worth being tied to weight loss. It is important for coaches to be aware that their own attitudes, beliefs and behaviours (such as an over concern with weight, appearance, body shape and dietary restraints) could contribute to increasing the risks. It can be particularly dangerous if coaches of girls demand that athletes stay the same weight while their bodies are developing.

If sports coaches and parents have this impact on girls' attitudes to body image and eating behaviours, it seems reasonable to assume that teachers with whom pupils spend greater periods of their day are also capable of asserting an influence over such attitudes and behaviours. It would therefore seem important that teachers heed the conclusions of Dale Mercier and that school health programmes continue to emphasis healthy eating while at the same time providing information on normal physical development during early adolescence to support young women who are coming to terms with their new "shape".

> ... The girls tried to get on the scales "lightly" whereas the boys tried to maximise their weight. ”

Sports coaches and teachers who suspect any of their students might have an eating disorder should identify the person who has the best rapport with the student. Ask them to approach the student to express concerns about their general health and well-being. If there is a problem with eating behaviour the aim would be to steer the student to an appropriate health professional for an assessment, for example, to a nutritionist, psychologist or medical practitioner.

The following extract from Clarkson, H. (1994). Eating Disorders. In H. McDowell & D. Ziginskas (Eds.), *"feeling stink" A Resource on Young People's Mental Health Issues for Those Who Work with Them* (pp. 18-22). Wellington: Ministry of Health may be of use in identifying those who need help.

Early signs of anorexia include:

- increasing concern about weight and disgust with body shape
- wearing only baggy or concealing clothing
- frequent washing
- excessive exercising
- refusing to eat with others
- rituals around eating, such as counting mouthfuls, eating from a particular plate only, or taking tiny mouthfuls
- lying about dieting ("I've already eaten")
- moodiness and hostility when asked about dieting.

Early signs of bulimia include:

- increasing isolation from others
- food disappearing, especially high calorie foods
- spending long periods in the toilet especially immediately after meals, sometimes with the tap running for long periods
- shoplifting food
- swollen cheeks (a little like mumps) caused by swelling of the parotid gland
- excessive tooth decay
- a callous at the base of the index finger.

Notes

Vivienne Adair, PhD and **Robyn Dixon, M.A.** are lecturers in the Education Department at the University of Auckland.

The research reported here was conducted as part of the research training and assessment component of a Stage III class in Adolescent Psychology in 1994.

The Australian study designed to find out why teenagers might want a different body size was:

Paxton, S., Werthheim, E., Gibbons K., et al. (1991). Body image satisfaction, dieting beliefs and weight loss behaviours in adolescent girls and boys. *Journal of Youth and Adolescence*, 20, 361-379.

The importance of sport coaches being aware of risk behaviours is discussed in:

Mercier, D. (1993). Athletes and eating disorders, Part 2. *The New Zealand Coach, Summer*, 20-21.

Further reading:
Earlier New Zealand research in secondary schools showed that 14 percent of the 1 500 girls surveyed displayed attitudes towards weight and eating that could lead to eating disorders, and that between three and eight percent actually had heating disorders:

Lowe, H.C., Miles, S.W., & Richards, C.G. (1985, May). Eating Attitudes in an Adolescent Schoolgirl Population. *New Zealand Medical Journal.*

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item 9

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number two 1995

Focusing on Technology Education:

THE EFFECT OF CONCEPTS ON PRACTICE

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Nicola Belsham

TECHNOLOGY EDUCATION is a new area of learning in New Zealand, and all schools will be required to implement it by 1997. Although a draft curriculum statement has been produced, *Technology in the New Zealand Curriculum (draft)*, there is a lot of confusion as to what technology education might be, and the implications of this learning area on education generally.

The draft technology curriculum is based on a broad concept of technology, and therefore technology education. One definition of technology which would sit comfortably within this concept is that:

> Technology is a purposeful activity aimed at meeting needs and opportunities through the development of products, systems or environments. It takes place within specific contexts and constraints, and is influenced by value judgments.

Technology education, therefore, is not about using technological artefacts, such as computers. The use of computers as a tool is in fact no more linked to technology than to maths, science, English or any other area of learning. Rather, the general aims of technology education are to develop:

- ❏ technological knowledge and understanding
- ❏ an understanding and awareness of the interrelationship between technology and society
- ❏ technological capability.

Meeting such aims requires students to be involved in purposeful activities, taking into account relevant issues, and possible effects their solutions may have.

The research reported on in this article arises from a two year research contract funded by the Ministry of Education called the Learning in Technology Education (LITE) project. The major aim of the research was to investigate the development of student technological capability as fitting within the same framework as the draft curriculum statement. The research was designed and carried out in four phases: exploring teachers' perceptions of technology education, development of technological tasks and their management in the classroom, analysis of students' existing technological capability, and the development of strategies to enhance students' technological capability. The research was both quantitative and qualitative.

The methods included recording and analysing:

- ❏ individual and group interviews with teachers and students (approximately 60 teachers and 700 students);
- ❏ planning meetings (44 teachers and other educators);
- ❏ classroom observation, including field notes (28 classes);
- ❏ student written and other material (700 students);
- ❏ teacher written material, including lesson notes and comments (60 teachers).

This article focuses on aspects of the research which sought to explore teachers' and students' concepts of technology and technology education, and how these concepts might have an effect on technological activities in the classroom. Given the central role both teachers and students will have in the successful implementation of technology education, it is important that there is a general awareness of these issues.

Teachers' concepts

The introduction of the *Technology in the New Zealand Curriculum (draft)* in schools during this research provided all participants with a common base from which to work. Working through this curriculum statement was an important intervention strategy. Researchers facilitated discussions centred around the relationship between the curriculum and previous research findings, in order to develop teachers' concepts of technology consistent with the draft curriculum statement. Teachers then worked from their concepts of technology to develop classroom technological activities.

The secondary school teachers' subject backgrounds were a strong influence on their concepts of technology education. For example, science teachers discussed technology in terms of applied science, social studies teachers focused on the effect technology has on society, English teachers discussed technology as an information technology tool, and technical teachers' view of technology was primarily focused on specific skills, and designing and making artefacts. This results in a wide range of concepts of technology in secondary schools.

In the primary schools there was an emphasis in the school on problem solving and many of the teachers talked about technology education as using technological artefacts, particularly computers, to solve these problems. Those teachers with a special interest in science expressed technology as applied science. The societal aspects of technology were mentioned by teachers in terms of allowing students to develop an awareness of technological artefacts and feel more comfortable with them. In the intermediate school technical teachers emphasised the importance of skills training in relation to technology education.

Teachers' concepts of technology education were influenced by their past experiences both in and out of school, for example music, computing, art, and sport. Other teachers were influenced by past careers, and tended to have an emphasis on "hi-tech" artefacts as tools in their view of technology.

Beginning teachers were often concerned with "teacher survival" issues and technology was perceived as an optional extra. Those teachers who had been involved in some form of long term teacher development programme felt confident about the introduction of technology education, although this was often in terms of science and technology, reflecting the nature of the programme they had worked through. The moves toward interactive teaching strategies would appear to have increased teachers' confidence to tackle new learning areas, such as technology. The teachers who might be classified as a high-risk takers were already doing innovative things in their classrooms, particularly at the primary school level. Generally, these teachers welcomed the challenge provided by technology education.

No teacher had a broad view of technology which emphasised the three possible main themes of technology education, that is, technological knowledge and understanding, technology and society, and technological capability.

This was shown to have major implications for the implementation of technology education. Technological activities which do not take into account objectives from each of the three aims would result in a programme which would not meet the requirements of the technology curriculum.

The effect of teachers' concepts on their teaching practice

The concept of technology held by teachers appeared to have a significant effect on their planning of technological activities and their subsequent classroom strategies. Teachers who considered that they were applying aspects of technology in their existing practice often saw no need to change in any significant way — neither their practice nor their conceptualisation of technology and technology education. For these teachers all that was considered necessary were a few minor additions. This could be met within their own units (for example, the workshop technology programme could include a discussion on the aesthetic preferences resulting from different cultural values) or by passing the students on to another teacher with expertise in the area.

The strategies developed by the teachers in their classrooms when implementing technological activities were often positioned within that particular teacher's teaching and subject areas. Subject background had a direct influence on the way teachers structured the lessons and developed classroom strategies. Teachers developed strategies to allow for learning outcomes which were often more closely related to their particular subject than to technology. This was particularly noticeable when some teachers entered areas of uncertainty in their planned activities – they often reverted to their traditional teaching approaches.

> "... English teachers discussed technology as an information technology tool."

Possible learning outcomes identified by teachers in a technological activity were influenced by their views of assessment, their expectations of the students and their views of learning. There was conflict between the potential learning outcomes from a technological activity and the summative assessment of a small number of objectives. Emphasis on a small number of objectives resulted in students working towards these in isolation from the activity. It is therefore important that strategies are developed so that students are assessed on their whole technological activity rather than isolated parts.

Some teachers at the end of the project acknowledged that participation in the research process resulted in a challenge to their concept of technology and saw this as possibly affecting their future classroom practice, both regarding technology specifically, and within their own subject area. It would seem therefore that the teachers themselves were very aware of the link between their concepts of technology and technology education, and their classroom practice. Changes experienced by these teachers, especially in terms of their concepts of technology education, often resulted in the need for extensive changes to their classroom practice as based on a rethinking of their educational philosophy. From previous research into teacher change, if such change is to occur, the teachers must have time and support.

Teachers also commented on the students' concepts of technology and expressed concern that they were often still quite far removed from their own, and those portrayed in the curriculum statement. They considered this to have a significant effect on the students' activity during a technology unit. These comments are supported by the research into students' concepts of technology and technology education as summarised in the next section.

Students' concepts

The research looked at concepts held by students from five classes — a new entrant class (5 year olds), a standard three and four class (9–10 year olds), and three form one and two classes (11–12 year olds).

The new entrant students were categorised as basing their concepts of technology primarily on technology as an artefact of some sort, or on technology as a process of doing something to meet a particular need. In the analysis of the older students, the categories used in the analysis of their concepts of technology were:

- artefacts — electrical devices or tools/machines
- inventions — new/different or past/present/future
- usefulness — meeting people's needs
- other — any concepts that could not be categorised under the previous headings.

For the analysis of older students' concepts of technology education, the categories used were:

- making/understanding
- designing/inventing
- meeting needs
- other.

The categories "artefacts" through to "usefulness" and "making/understanding" through to "meeting needs" represent a progression from narrow concepts of technology, and technology education, toward more broad, inclusive concepts — similar to those employed in the draft *Technology in the New Zealand Curriculum* statement.

New entrant students' concepts of technology were relatively evenly spread between artefact and process, but all appeared to include some emphasis on technology as something linked with people. These students therefore could be interpreted as holding relatively broad concepts of technology.

The majority of the standard three and four students' concepts of technology appeared to be based on an artefact, as distinct from society and/or people. Of those students basing their concept of technology on a process, very few focused on meeting the needs of people. The majority of the standard three and four students' concepts of technology education would appear to be based on the study, making, and/or testing of artefacts. Few of these students included "meeting needs" in their concept of technology education. Standard three and four students would therefore appear to hold a relatively narrow concept of technology and technology education as based on "technology as an artefact". These findings would appear to be in keeping with other New Zealand research findings which have concluded that "overwhelmingly, students saw technology as a recent phenomena ... and as artefacts".

A slight majority of form one and two students held concepts of technology as an artefact, and these were slightly more likely to be perceived as being any tool or machine. However, there were also a number of students who viewed technology as a process. Over half of these students perceived social factors to be important. The majority of form one and two students held concepts of technology education as centred on "making/understanding".

This research employed a gender analysis on data when student numbers were sufficient to get meaningful comparisons. From these findings any differences which may be attributed to gender would be by way of a positive difference for girls. That is, the concepts of technology and technology education as underlying the *Technology in the New Zealand Curriculum (draft)* statement would appear to have a greater level of commonality with more girls' concepts than boys'.

The effect of students' concepts on their technological practice

Previous research in New Zealand has shown strong links between students' concepts of technology, and their technological practice (that is the way they carry out technological activities in the classroom). These research findings would appear to support this linking. However, the interaction is considerably complex and dependent on a number of variables.

The majority of the new entrant students undertook their technological activity in an holistic fashion. This appeared to be linked to an understanding of the importance of internal linkages, especially between a process of design and any solution(s). This linking and reflecting can be interpreted as another important aspect of a person's concept of technology. Remembering that the new entrant students appeared to hold relatively broad concepts of technology, it could be interpreted that students with a broad concept of technology are more likely to undertake technological activity in an holistic manner similar to that valued and encouraged by the objectives stated in *Technology in the New Zealand Curriculum (draft)* statement. For students to undertake technological practice in an holistic fashion was quite unusual in all other classes participating in the research. No other students showed as broad an initial concept of technology as did the new entrant students. This could be interpreted as supportive of a link between concept and practice.

Although full class data was collected on the standard three and four students' initial concepts of technology and technology education, the ten students used in the further analysis provided an indication of a link between concept and technological practice. This was however a small group, any extrapolation from this data is highly speculative. Analysis of the data showed two trends. Firstly, if students' concepts of technology and technology education were inclusive of those underlying the technology unit, there appeared to be a significant level of reinforcement of students' concepts due to participation in the activity. The students' technological practice in this case appeared to directly reflect their concept. If, however, the students' concepts of technology and technology education were significantly different from that on which the technology unit was based, there appeared to be little change in students' concepts. Instead, concepts appeared to constrain the students' activities, or, alternatively lead the students to perceive their activity to be non-technological. The students' concepts would therefore appear to have more impact on the students' technological practice than the teaching strategies employed in the technological activity. This would go some way toward explaining why the research found little improvement in the students' overall/holistic technological capability over the first and second trials. This was further complicated by the students' narrow technological practice and the fact that concepts of technology began to affect what happened in the classroom and subsequently the teachers' own concepts of technology education. This supports the prediction from previous New Zealand research that most students' concepts are both limited and limiting.

In the three form one and two classes, these trends were not apparent. Rather than retaining their initial concepts of technology and technology education, these students appeared to have moved to broaden their concepts of both technology and technology education after partaking in a technology activity. The overall pattern of change for form one and two students was an increase in the number of students who held a concept of technology as centred on process, especially emphasising the social aspects. There was also an increase in the percentage of students categorised as "other", representing a level of uncertainty as reflected with a concept based on a vague notion of "everything" and "anything".

The difference in trends could be interpreted in many ways. Perhaps the ten standard three and four students could not be considered typical and given the low numbers this would not be an unrealistic interpretation. Alternatively it could be that as there were more students with a broader concept of technology and technology education in the form one and two classes retaining an alternative concept would be more uncomfortable. The period of time the activities ran in the form one and two classes was significantly longer than that of the standard three and four students, and there was more group work and teacher/group/class discussions over this period of time. Those students beginning with a narrower concept therefore would have been likely to have experienced a more sustained challenge to their concepts than those at the standard three and four level. This would have allowed for far greater opportunity for each student to reflect upon their own concepts and perhaps construct some changes. Another interpretation is that these students have been in the school system longer and therefore could be more likely to recognise disparity between their responses and those expected by others. Perhaps what was found represented not so much a concept change but more simply a response change to something perceived to be more acceptable. It is apparent there needs to be much more research done in this area in order to explore the effect of technological activity on students' concepts and *vice versa*.

Summary and implications

Teacher and student conceptualisation of technology and technology education are complex issues. The research reported here would strongly support that there is a link between teachers' concepts of technology and technology education, and their teaching practice in technology. Newly developed broad concepts of technology and technology education appeared to be somewhat fragile and transient in nature, especially when they were challenged by students' narrower concepts, and their own uncertainty in new areas of technology teaching practice. This resulted in a reversion toward previous conceptualisations, which was in turn reflected in their subsequent classroom practice. The extent to which this occurred was largely determined by the level of comfort teachers felt with the concepts of technology developed during the intervention process and the teachers were often unaware of any change or reversion.

The research also supports a link between students' concepts of technology and technology education, and their participation in, and perception of, technological activities. The way in which this link manifests itself is however reliant on many factors — including, we would suggest, the nature of the initial conceptualisations, the biographies of all those involved, and the surrounding environment.

Some implications of the research reported here are:

☐ Exploration of teachers' concepts of technology and technology education are crucial in technology education teacher development, and subsequent development of technology education;

☐ Exploration of students' concepts of technology and technology education are crucial in the development of technological classroom activities;

☐ Further exploratory research on the links between concepts and practice needs to be undertaken, including studies which document change as it occurs over time.

Notes

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Alister Jones is a senior lecturer, with responsibility for technology education, at the Centre for Science, Mathematics and Technology Education Research, University of Waikato.

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Summaries of the form one and two students' technological practice are found in:

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Children's Response to Teachers

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Adele Jackson

GIVEN THE CIRCUMSTANCES in which they operate I am often amazed how well teachers do. At the best of times, teaching is a very complex job. Far from dealing with physical symptoms of one person at a time, like a doctor, a teacher is trying to understand, enlighten, control and motivate the minds of about thirty individuals at the same time. The demands on those wishing to do a good job are great.

But the teachers do not have a chance to perform in the best conditions. Quite apart from the fact that they are dealing with large numbers and with a lack of support in terms of resources, they are having to put up with many outside pressures which diminish their status and their professionalism. In all the many studies of effective schools that have been carried out throughout the world there are a number of broad conclusions on which they all agree. Good schools depend on teachers who have a sense of ownership over what they are doing and a sense of shared purpose. Good schools depend on teachers having time to think and having time to share their thinking with other teachers at the school.

The problem for many schools is that the basic requirements for "good schools" tend to be ignored by those who control them. Instead of ownership and professional standards, we witness a centralised curriculum and batteries of assessments — most of which the teachers find meaningless.

The result of this is a host of disaffected teachers, and even more tellingly, disaffected children. Many pupils find school a meaningless burden that makes little sense to them. We therefore witness the growth of truancy where the pupils make their own judgment about their experience of school plain. But these are just the obvious manifestations of disaffection. There are many children who are excluded from school because of behaviour problems. What of those who psychologically exclude themselves, who play the game of mental truancy by pretending to work but who are day-dreaming; those who learn how to avoid work? And what of those who have been called the "invisible children", the ones who have become accomplished at not being noticed, at doing the minimum amount of work not to get into trouble?

THE RESEARCH on which the findings of this article are based derive from two different types of study. Firstly studies about disaffected children — the truants, the bullies and their victims, the excluded and the unhappy who all have very clear (and negative) views of school — and secondly, studies of children in school, ostensibly happy and successful, whose views about teachers in both primary and secondary schools are not those of the failures but the successes. It is important not to dismiss their opinions.

If the results of some of this research make depressing reading this is not the fault of the teachers. It is important to understand the difficulties of being a teacher and the mind set of individual children growing up. In order to understand what to do we need to understand the worst as well as the best. The article will start with some of the negative aspects which emerge from children's experiences, but it will end up with the positive.

Any understanding of the teacher's job, especially through the actual experiences of children, needs to begin with the tension between the personality of the individual teacher and the role that he or she has to play. If the teacher does not play the professional role there are real difficulties in terms of discipline. On the other hand, it can be a shock for children to realise that the teacher is human.

Children, of course, are aware of this tension. They like to see if they can make a teacher step out of the role into something different. In Jan Mark's short story children have bets (and counter-bets) on how long they can make the teacher stay off the intended task. Those children, called "jokers," are the ones who try to test whether the teacher can share a joke and how far they can take it. The very charisma of a teacher comes from the tension between their public role and their private face.

Children naturally respond to personality as well as role. When one observes incidents of jobsharing, with one teacher taking the morning and the other the afternoon, we see how differently individual children react to both of them. The curriculum and the agreed teaching style might be the same but the children react differently and are motivated differently. Children are, in fact, fully aware of the tension between the person and the role. Sometimes they resent the fact that the teachers take their position too far:

> She's a bit bossy and a bit ... she don't talk to people, you know, the way we have to talk to them, like. Like we have to say please and she didn't say please like we have to say please. (boy, secondary)

And sometimes they dislike the sense of the over-familiar.

> It's embarrassing. She comes past and winks at me. She comes around and calls me love and asks me to do things. I don't know why I'm popular with people. (boy, secondary)

TEACHERS are constantly scrutinised and judged. The judgments are passed on from one pupil to another. Each child has comments to make about all the teachers and, indeed, those teachers they only know by repute. They do not always agree with each other about particular teachers, but they do agree on the characteristics of a good or a bad teacher. The problem for pupils in a school is that whilst they make judgments about teachers they are essentially in the hands of teachers, they are ruled by teachers and have to accept their place in the hierarchy. Trouble arises when they no longer do so.

From the children's point of view, school exists for the sake of teachers, not for pupils. The children think of themselves as being there to give teachers a job, to justify their existence. They do not think of schools as being there primarily for them. They are aware of the immense power that teachers have over their lives and the difference they make:

> ... The work's fun ... because the teacher is nice and if you had a teacher who was horrible you wouldn't want to get on and learn and if you've got a nice teacher it's easier to learn. (girl, primary)
>
> I don't mind her being strict because she was kind. Mrs B. was terrible; she used to take it out on us. (girl, primary)

The difficulty for children is that schools automatically put all power into the hands of teachers. This is why the most plaintive cry is that "it's unfair". Children accept the need for discipline, but often experience it being carried out unjustly. All of them describe incidents when they feel the teacher is unfair. The phrase that all the children use is being "picked on". As in the cases of being bullied, they feel themselves to be victims of unkind attention that draws out their being different

> If a teacher didn't like you they'd be picking on you all the time and telling you off. (boy, primary)
>
> Always picking on me, saying it was always me — and if I say I don't, getting me into trouble. (boy, secondary)

"They", the teachers, keep "picking on" children. Sometimes it's particular ones, but *all* pupils have experienced this. The result is that all pupils have experienced a strong sense of fear; of personal hurt. The very role of the teacher can cause traumas:

> When I talk with Mrs W. my voice goes all funny. I don't know. My tongue goes all twisted. I get a bit nervous. (girl, primary)

> Mrs W. was terrible. She used to take it out on us. I can remember doing a "K" and I used to do the big "K's" in the Infants and I couldn't do the little "K's" it took me a long time and then when I was trying to learn something, the dinner bell would go and I'd get ever so upset at the dinner break because I thought I might be kept in. Once I was trying to read a word and I couldn't find out what this word was and I went to Miss. It was "the" and because I couldn't read it I was ever so frightened because she kept going on and on and on. (boy, primary)

THE SUFFERING that children undergo is not intentional. Few teachers deliberately set out to hurt feelings. But given the nature of their role and the power invested in them, and combined with an imposed curriculum and the need to control large classes, it is not surprising that all children's experience of school includes some painful moments. After all, they are constantly being tested, to see if they *fail* to answer correctly. Even the most bland of open questions — "How are you today?" — is treated by pupils as a closed question to which they have to guess the right answer. "Why is she asking me this? Why me? What is she going to ask next? What does she want?" They are so accustomed to simple right or wrong answers that the whole tone of school suggests that they are either measuring up to standards or failing. For all children at sometime in their school life school suggests failure. For some children, school always suggests failure.

Teachers are the ones who impose the standards that children need to meet. Teachers are the ones who set the tasks designed always to be a little bit more difficult. The children are, therefore, alert to their own failures and those of others. They feel that teachers are imposing a burden on them rather than helping them:

> The teachers might tell you "Come on, get on with that work, sit there and be quiet." (boy, primary)

> And they just go "go away". (girl, secondary)

Even the language symbolises the roles that teachers play. The most commonly used word by teachers is not "no", or "be quiet", but "right", a signal word meaning anything from "stop" to "listen to me", to "And now we'll start something new. Right!"

From the point of view of children, the phrase most commonly used by teachers is "Do it again".

SO FAR, the comments have been about teachers whom children consider to be fairly normal. Children might prefer some teachers to others, but consider it a normal part of the experience of school to suffer a bit from them. But these teachers are normal if we contrast them with a case study of a teacher whom all the children who suffer from him agree symbolises all the worst characteristics of teachers.

Children are very clear about what makes a bad teacher. Analysing their experience of such a case in a secondary school points up exactly what goes wrong when a teacher cannot work out proper professional relationships, when personal feelings undermine true judgments.

The first characteristic of a bad teacher is the lack of belief in the children or their work:

> It upsets me when he shouts. He shouted at me once and I felt upset. He said my work was rubbish. (girl)

> He said that it really was horrible and she might have to do it again and she burst out crying. (girl)

Most children try desperately hard to please the teacher and dislike having their work demeaned. It is easy to undermine confidence by pouring scorn on what is produced or inventing impossible targets.

Such attacks on children's work partly arise because the teacher creates conditions in which it is impossible to work. No-one can properly concentrate: the fear of not doing well enough undermines standards:

> I get kind of very nervous and when he shouts I'm sort of edgy and then I make mistakes ... he says it's 'cos of us he shouts, but I don't think it is really. (boy)

There is clearly a constant tension in the air which derives from the uncertainty about what the teacher will do next.

This impossible working atmosphere stems from the arbitrary nature of the teachers' regime. The teacher indulges his changes of mood:

> He goes bright red when he tells you off and you try not to laugh, and he goes calm and then he suddenly starts shouting at you. So we don't talk at all, we just get on with our work, not even looking around. (girl)

The teacher is not consistently firm but arbitrarily angry. He is clearly not in command of his own feelings, which he indulges:

> He shouts a bit when he gets angry — he really does shout. Once he got really angry with us — I don't know why — and he said "Whenever your class comes in, it always makes me angry." We didn't know why he said that. (girl)

> He does get angry if we ask after he's explained something — he's often in a bad mood. (boy)

Children detect a lack of control over himself. They realise that he is not just being angry as a way of maintaining discipline, let alone raising standards of work. Their terror comes about because his assumptions about their behaviour and their work border on the pathological. He is bad-tempered rather than strict.

ONE INSECURITY that children feel in this arbitrary regime is not knowing who will be picked on next. The phrase being picked on is one that children use when they are victims of a bully. This teacher uses his authority to create tension in making arbitrary judgments.

> Anything we do — every peek — he shouts at another person that's right near you. It can be ... well, I know I am a bit silly now ... but a bit scared. You dunno what he's going to do, turn ... I put my head down and prayed. (boy)

> He's always picking on other children in our class and it's not fair on them, and you never know who he's going to pick on next. (girl)

Nothing causes such difficulties for children than this abuse of power. Instead of their belief in fairness, they are confronted with a regime that does not make sense. With their own best judgments they cannot really understand *why* he becomes angry or *why* he suddenly picks on individuals. They don't know who will be the next victim.

> He finds different people. First he picked on D. and then there's two boys who sit together. He's always picking on them, and there was one boy called Gary and he made him move and he didn't even do anything — I don't know what he did — I think he dropped his pen and went to pick it up. Who's he going to start on next? (girl)

THE RESULT of all this bad temper, self-indulgence and undermining of children's confidence is not only a lowering of academic standards but a classroom of children who despise the teacher. The children fear him but do not respect him. There is something essentially ridiculous about a teacher who goes bright red and shouts at everybody. This is why, despite themselves and their insecurity, the children have to stop themselves laughing — "you try not to laugh". At the heart of the brutal lies the ridiculous.

But there is something in the teacher that children despise even more. His singling out of individuals, and his attempts to explain himself signal an attempt to strike up some kind of personal relationship, however twisted. At the centre of the lack of control is a strong desire to be understood, even to be liked:

> and then in the end he tried to be all nice to her and as if he hadn't done it. (girl)

> and he started, like, being more friendly, and saying "I'm your friend". I don't think that's right — you go crawling back to a child after you've started at them, just to become their friends. (girl)

What the children describe might be an extreme case, but it is an extreme that points up the characteristics of an ineffective teacher. The children's work is put down, and their self-confidence undermined. There are no clear and consistent rules of behaviour being followed. The picking on individuals, the loss of temper, the emotional tension, and the attempts to be liked all point up the teacher who is not playing a proper role and who damages the motivation of children.

> He starts telling people that they're not very clever, and their work isn't good and all that. (girl)

SUCH A CASE makes one look with more understanding and more admiration at all those who are effective teachers — firm and consistent, caring for the children more than themselves, having the patience and intelligence to explain complex matters to around thirty individuals — all of different abilities, temperament and styles of learning.

Children are equally clear about the characteristics that are typical of good teachers. They have observed and judged, compared and contrasted over many years. Even the pupils who are most disaffected with school remember some good teachers; just as all have experienced bad ones. When one puts together a synthesis of children's views of effective teachers certain strands emerge.

The good teacher is someone who shows a genuine interest in the pupils. This manifests itself in two ways. The first is the ability to combine firmness with humanity. Teachers know they must enable their pupils to work. This means that they impose a regime that respects discipline and fairness. In fact children consider a certain amount of strictness as an essential.

> With a good teacher you can get on better, but with a soft teacher you can't do much. (girl, secondary)

At the same time children expect the teacher to have a human side, to be able to share a joke — the other side of charisma:

> It's nice in Mr D's class. He always makes jokes and things. (boy, secondary)

Children expect the teacher both to play the professional role and to reveal that they have a real personality — not as a self-indulgence, but as a sign of self-confidence. But what they most respect is the second characteristic of the good teacher and that is the ability to make things interesting. There are two main signs of this. One is the ability to explain; to communicate clearly and to show an interest in doing so:

> If you still don't understand, you can go up to her and she explains it. Like fractions or anything you don't understand. Now I do because she does them again with you and shows you. (girl, primary)

The other sign is the ability to vary the teaching methods, by giving children clear tasks, by including games and challenges rather than sticking with routines:

> Learning your tables isn't fun, but doing things is. (boy, primary)

In fact, children are very clear about the typical characteristics of the effective teacher. They are, in many ways, in the best position to know. They also have a clear insight into what makes some teachers fail. Just as the tension between the personal and the professional can be effective, so it can get out of balance and cause both unhappiness and failure in children.

The task of the teacher is never an easy one. The comments of the children make this very clear. Having an understanding of the bad and the good is not enough in itself, although it is at the heart of any improvements one can make to the lives and achievements of children. Having understood, we need to know how we can enable teachers to do their best, not by assessing them, by labelling them good or bad, as seems to be the modern way, but by giving them the conditions in which real teaching and real learning can take place. Good teachers are, after all, of great significance.

Notes

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The research referred to in this article is published in:

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Children's Understanding of the Superheroes

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John Gillespie

THE ANCIENT EGYPTIANS have been credited with inventing the comic strip and, by implication, the superheroes. How else can we interpret the tomb decorations of Lion-Man, Ram-man, Dog-man, Ibis-Man, and even the original cat woman, Bastet? Modern day superheroes and superheroines evolved in the United States after the first World War, flourished in the 1940s and 1950s, and continue to enjoy success and status.

Children of the 1940s and 1950s met their superheroes via the comic book, radio programmes and early movies. Today's children meet them overwhelmingly through the medium of television. Research findings suggest that the average 3-4 year old in the U.S. watches television for 2-4 hours each day. Australian research suggests the same is true for our own preschoolers, who have access to the entertainment provided by television and video in amounts than were unthought of in 1938 when Superman made his debut!

The attraction of superheroes

Although it is not suggested that preschoolers' viewing is restricted to the programmes that feature superheroes, we do know from both anecdotal and research evidence that preschoolers are enthusiastic consumers of the superhero culture.

Why is this so and should parents and teachers be concerned?

Perhaps preschoolers involved in superhero play are working out some deep seated-developmental issues, such as aggression, fear, hostility and a sense of safety. The powers demonstrated by the superheroes are powers the children themselves would like to have.

The study

One way to find out if superhero worship causes any problems for preschoolers is to ascertain how much they understand about the programmes they watch.

This study involved talking with children about their ideas and attitudes to the superheroes in a project which drew on the researcher's expertise in working with teachers and children engaged in drama experiences. Favouring a naturalistic approach, the study focused on aspects of television programmes available to young children during their normal television viewing, rather than using specifically devised programmes.

The participants in this study were 203 preschool children aged 3-5 years (125 boys, 78 girls) who attended early childhood centres (a total of fourteen centres) in city, suburban and country areas of New South Wales.

The researcher had stimulus material in the form of six comics, each one showing clearly, on the cover, a picture of a superhero. The characters chosen were Superman, Batman, Spiderman, The Incredible Hulk, The Phantom and The Ninja Turtles. The first five superheroes were regard by the researcher as long established "classic" superheroes. The Ninja Turtles were, at the beginning of the study, enjoying a wave of popularity amongst children. Each comic was sealed in plastic so children were unable to open the book. This was to focus children's attention on the cover picture alone.

The researcher went into an early childhood centre at the time when the area was set up with a range of activities from which children could choose. On some occasions these activities were set up inside the centre, in others outside. The researcher sat at a table with the comics spread in front of her. She was, in effect, one of the available activities.

As children approached the table she said "Look I've got a few pictures here, but I'm not sure who they all are and I wondered if you could help me." As the children responded, the researcher extended the discussion by questioning. The questions were not pre-arranged and therefore set, but followed on from the contributions of the children, although certain questions recurred throughout the research. The interactions between children and researcher were tape recorded and later transcribed.

What the children said

The naturalistic research methodology was, I believe, effective in eliciting children's real ideas about and understanding of the superheroes. The fact that the researcher reflected back the children's responses (using the technique of active listening) and based her probes on the children's prior responses meant that there was less chance of children being led to respond as they believed the researcher wanted.

The children's comments were examined and sorted by the following categories:

Superheroes' activities : antisocial

Superheroes, their colleagues and enemies engage in a number of anti-social activities. They fight, push bad people off buildings, kick baddies in the face, break doors, crash houses, throw people in the dump and off the roof, punch, kill, wrap people in webs, throw stones, put people in chains, bash down buildings, and rob people. Certainly not all these activities were attributed to every character by every child; nevertheless it is an impressive list of antisocial behaviour.

Superheroes' activities : prosocial

The prosocial behaviour was often similar, but as it was reported as having been done for the right reasons, I've categorised it also as prosocial behaviour.

In this category, the superheroes and their friends (but not their enemies) fight baddies, fly, build up buildings (they have previously destroyed), climb walls, help goodies, stop people from hurting others, drive to other countries, kill baddies, save people, lift buildings and trucks, rescue people, do Karate, catch people, get bad people ("that's his work," explained one little boy), dance and save princesses in pools.

Special abilities of the superheroes

As part of these busy rounds of activities, superheroes were seen as having some special powers which facilitated their undertakings. In particular they can fly, climb and/or stick to walls, glide, use magic, somersault, and are fierce. They have powers (power rocks and power belts were mentioned). As one boy stated "Batman is the boss of the world."

Their belongings and accoutrements

Superheroes have variously swords, ropes, special scissors, cars that fly, special shields, a turtle airship, a batmobile, costumes, skateboards, costume wings, a car with a radio, a Bat boomerang, guns, Kryptonite, fire and weapons.

Some of the children mentioned their own belongings, which were superhero related. The children owned costumes and/or masks for one or more of the superheroes. They had cars, including bat cars, guns, books tapes and videos.

Their living arrangements

Where do these wonderful creatures live? There were many claims made. They live in another world, in a cave in space, where there are buildings, in Australia, in a different Australian planet, the planet Mari, in the sewers and in drains (baddies like the smell, apparently) a normal house, Paris, Hong Kong, MacDonalds (this answer was given by a little girl at the time MacDonalds were having a promotion featuring Batman), South America, England, the Bat Cave and under the ground.

Some misconceptions

As well as the misconceptions already shown, some of the children said:

> Superman has a daughter called Lois Lane
>
> Spiderman speaks out of his eyes.
>
> In comics [about the superheroes] there are balloons so you have to guess which person is talking.
>
> Penguin has a lot of penguins: Catwoman has a lot of cats.
>
> Spiderman's eyes are laser hot.
>
> The turtles used to be normal: now they are real.
>
> Batman and Superman are brothers [sometimes they were said to be merely friends].
>
> Spiderman doesn't bite men because he is the Daddy spider.

What is a baddie?

Goodies and baddies featured largely in the children's explanations. The superheroes and their friends, on the whole, were believed to be goodies. Baddies on the other hand were quite easily identifiable.

Baddies have horns, they wear masks (Superman was good, one child explained because he did not wear a mask), they have money taken from a bank, they have a bad face or simply look bad. One child screwed up his face to show me what he meant. Baddies have teeth that show they are bad, goodies keep their mouths closed. Baddies have nasty names ("like bumshit") and they wear black.

Baddies just become bad for no apparent reason; "because" was a favourite explanation. "No-one knows except God" explained one child, but thankfully for us all, there are no baddies in Australia and baddies can turn into goodies, although how or why this occurs was a mystery to the child who suggested it.

What is power?

The power of the superheroes was constantly referred to. When the researcher asked about this power there were many explanations.

> Power is energy and you can fly.
>
> Powers are in the body; you can't see them.
>
> Ordinary people don't have powers.
>
> Power is big muscles; if you are strong you can do what you like.
>
> With power you can jump over the water.
>
> They take a big breath and that gives them power.
>
> Their costume gives them flying power.
>
> They say "stop it" and it stops.
>
> Power makes them strong; it has strong stuff in it.
>
> I have powers at home; they are small things I put on my back.
>
> Spiderman has special things in his mind that tell him when a baddie is coming.
>
> Power is when you use special words like *abracadabra or ding dong dell.*
>
> If they didn't have powers they couldn't fly.

But are they real?

The bridge between fantasy and reality is fragile for young children. On one hand, most of the children spoke as if the various characters were real, but at the same time, some at least accepted that there was a fictional element about it all. "They are pretend people: they are not real." "They are in a movie." "They are only in cartoons."

Others were aware that the characters did not exist in this world, but thought they did in some other place.

> There's no such thing as Superman in this world; he's in another world.

One boy claimed more intimate knowledge. "They came in my house and they live in the roof. I don't know what they talk about when I'm not there." (A probing question indicated that the child didn't know what these roof residents talked about when he was there, either.)

Another, while explaining that Superman and Batman catch criminals, told the researcher about a burglary at the kindergarten when thieves had broken in and stolen videos and television sets. He explained that the police had been called.

> **Researcher:** Why didn't Batman or Superman come?
>
> **Child:** No-one rang them up
>
> **Researcher:** Why not?
>
> **Child:** Didn't know their number

Some children explained that Superman and Batman, in particular, were real people who became fabulous when they donned their alternative attire although there was some confusion.

> Superman has a working suit, but he can only fly in his Superman suit.
>
> He's a paperman [Superman]. He just sells papers and then he puts his clothes on.
>
> Superman dresses up as a newspaper reporter but he is really Superman and not a reporter. He dresses up so you will not see his Superman clothes. He wears ordinary clothes over his Superman clothes.

The moral issues

As suggested in the lists of pro and antisocial behaviour attributed to the superheroes, there was a certain amount of confusion. This area was extended by asking children to explain why it was acceptable for Superman, Batman and Co. to fight, kill and maim, but it was not acceptable for other characters in the stories (for instance Joker, Penguin, Catwoman). The children saw this in black and white terms. Superman and Batman were goodies and the others were baddies.

When the issue was extended by the researcher asking "But I don't understand why it is all right for goodies to fight. I've heard you shouldn't fight." Again the answer was simple. They are goodies and it just is (that is, all right for goodies to fight). The topic was pursued. "Well, you are good people here, aren't you? Is it OK for you to fight like Superman?" This suggestion was dismissed with the scorn it was seen to deserve. One child explained it carefully.

"It is all right for Superman to fight because he fights baddies. The baddies cannot fight because they are baddies and we cannot fight either."

Discussion

What does it all mean? It is possible that there has been too much media attention on the dire consequences of children's interest in superheroes. Perhaps some early childhood educators have become so paranoid over the issue of superheroes that they have allowed their own fears to intrude into children's play.

The findings from this research compare with the findings of other research in the following ways:

Pro and antisocial behaviours

Research into children's comprehension of emotions shown on cartoons found that while children found it difficult "to understand the complexities and nuances of the often changing and emotional states" shown in the cartoons, they had a general idea about the emotions portrayed.

In their identification of pro and antisocial behaviour the children in the study discussed in this paper did suggest that they had, with some accuracy, identified the motivations for such actions although their responses did not indicate much in-depth thinking.

Children often interpret the role of the superheroes as being primarily that of fighting "baddies". In children's superhero play the focus is certainly on the fighting with most participants choosing to be "goodies". The children know that they are only pretending to fight and that they are not allowed to hurt others. This was certainly borne out by the responses to the current study where the children showed great interest in the fighting prowess of the superheroes but recognised that fighting was not acceptable behaviour for themselves.

Are they real?

Like other research, this study found that young children did not fully understand the implications of a superhero's transformation from a human into a superhero. They tend to see the superhero and his alter ego as separate identities. Young children are not particularly adept at explaining what happens during the transformation.

One investigation into children's perceptions of television images asked young children if the images on a television screen were real objects that could be felt if one put one's hand inside the set. The four year olds responded to this as if they could hardly believe a seemingly intelligent adult would ask such an unintelligent question!

I have had the same response when I have asked questions as if I really do not understand some issue and need to have it explained to me. When I questioned the violence on a video game that was attracting a three-and-a-half year old boy, he looked at me in amazement. "It is only on the computer!" he said. We do underestimate young children.

Demystifying the superheroes

There are ways in which children's interest in the superhero culture can be harnessed productively. When children are given the opportunity to examine the superhero culture in some detail it enables them to consider the issues in rather more depth than simply watching cartoons and replicating in their play the few actions (usually violent) they are able to replicate.

Children can be encouraged to understand how superheroes are created, dressed, and made-up. This serves to demystify the character and make it less frightening for young children. They can be shown how a television programme is produced, and for instance learn about stunt men and women who practise hard to develop the ability to make fake fight look real. Although young children's gross motor co-ordination is not sufficiently developed to allow them to acquire the same degree of skill, they find it an interesting and challenging task to see how well they could manage to "fight like they do in the movie".

Television and violence are realities in our society. So too is television violence and the superhero programmes which are certainly a part of that television violence. Their attraction for children is real and as early childhood educators we will not serve the needs of children by hoping they will go away. We need to consider positive ways of dealing with children's replication of that violence in their play.

What is power?

The power of the superheroes is unquestionably attractive to small children. In the research reported in this paper, these powers were mentioned frequently though defined in some rather strange ways.

Children can be so enmeshed in the strength/courage/power aspects of the superhero culture that they ignore the kindness/helpfulness/generosity side of the superheroes. The children in the current study did not ignore these latter features but did not show any evidence that they were able to separate the two.

Early childhood teachers can build on children's interest in the powers of superheroes by encouraging them to recognise and emulate the humane characteristics and by likening prosocial behaviours to activities of the superheroes. There is, for example, an independence of spirit demonstrated by the Ninja Turtles. The power of traditional fairy stories can assist children in their understanding of the concepts of good and evil. The superheroes can offer the same potential.

Conclusions

The superheroes are here to stay. Particular manifestations of the superhero culture will come and go, but as one superhero star wanes, another rises. When I first became interested in the superhero phenomenon Voltron, He-man and the Battle of the Planets blazed across the television screens near me. As I began the research the Ninja Turtles seemed set to take over, if not the world, at least the hearts and minds of Australia's preschool children. They too have faded from view to be replaced by yet another heroic character.

Every generation admires and attempts to emulate someone or something that appals their parents and their teachers who predict dire and terrible consequences as a result. Does this mean that as educators we can ignore the current superhero craze in the certain knowledge that it will disappear? Of course we cannot. We can, however recognise that prohibition has a poor success rate. We can look at the superheroes in proportion and realise that the latest of the tribe will not lead to the end of civilisation as we know it.

We can be reminded of Jung's assertion that we all carry within ourselves the potential for being all sorts of people. Human beings have always told each other stories and through those stories touched these inner aspects. Educators have long recognised the importance of helping children come to terms with a whole variety of stories and have understood that the stories told by all cultures contain truths about that culture that are part of children's heritage. Why is it difficult for us to accept that the superheroes, so attractive to children, may also be contributing to their understanding of their world? They deserve to have us work with them to assist this understanding. We have a responsibility to help children recognise the negative elements in our society, to keep them in perspective and develop strategies for coping with them.

Notes

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This article is based on the following paper (which contains a full bibliography relating to children's television viewing and violence not covered in this article, and a discussion of the methodology used in this study):

Warren, K. (1994). *Preschool Children and the Superheroes: What do Children Understand — An Examination of preschool children's ideas and impressions of the superheroes*. Paper presented at the 20th Triennial Conference of the Australian Early Childhood Association, Perth.

For an analysis of gender differences found in the study see:

Warren, K. (1994). An Examination of Preschool Children's Ideas and Impressions of the Superheroes: some implications for gender education. In *Voicing our Agendas: Gender and Teacher Education Conference Papers* (pp 181-191). Ubud, Bali.

That the Ancient Egyptians invented the comic strip is claimed in:

Adams, P. (1992). Revenge of the comix. *The Weekend Australian*, October 10-11, 16-17.

The television viewing habits of 3-4 year olds in the U.S. is from:

Huston, A., Wright, J., Rice, M., Kerkman, D., & St. Peters, M. (1990). Development of television viewing patterns in early childhood: a longitudinal investigation. *Developmental Psychology*, 26(3), 409-420.

Sources for the use of drama in encouraging children's imaginative input and problem solving abilities are:

Heathcote, D. (1984). *Dorothy Heathcote's notes*. In L. Johnson and C. O'Neill (Eds.) Dorothy Heathcote: collected writings on education and drama. London: Hutchinson.

Warren, K. (1990). Can we do a play about the Ninja Turtles, Miss? Using the superheroes constructively. *Journal of National Association for Drama in Education (Aust.)*, 15(1), 36-9.

Warren, K. (1992). *Hooked on drama: the theory and practice of drama in early childhood*. Sydney: Institute of Early Childhood, Macquarie University.

Warren, K. (1993a). *Dorothy Heathcote and drama in early childhood*. Paper given at International Conference to Celebrate the Work and Influence of Dorothy Heathcote. Lancaster, England.

Warren, K. (1993b). Empowering children through drama. *Early Child Development and Care, 90*, 83-97.

That the role of the superheroes is primarily that of fighting "baddies" is from:

Dawkins, M. (1991). Hey dudes, what's the rap? a plea for leniency towards superhero play. *Australian Journal of Early Childhood*, 16(2), 3-8.

Other research into children's understanding of superheroes' transformations includes:

Cantor, J., Sparks, G., & Hoffner, C. (1988). Calming children's television fears: Mr Rogers vs The Incredible Hulk. *Journal of Broadcasting and Electronic Media*, 32(3), 271-288.

An investigation into children's perceptions of television images is reported in:

Flavell, J., Flavell, E., Green, F., & Kortmacher, J. (1990). Do young children think of television images as pictures or real objects? *Journal of Broadcasting and Electronic Media*, 34(4), 399-419.

Jung's assertion was remembered by:

Hearth, M. (1989). Rediscovering the power of fairy tales. *Young Children*, 45(1), 58-65.

Sources for other research into children's ideas about superheroes include:

Collins, W. (1983). *Interpretation and inference in children's television viewing*. In J. Bryant and D. Anderson (Eds.) Children's understanding of television research on attention and comprehension. (120-150). New York: Academic Press.

Cupit, G. (1989). *Socialising the super heroes*. Resource Booklet, No. 5. Canberra: Australian Early Childhood Association.

Downs, A. (1990). Children's judgements of televised events: the real versus pretend distinction. *Perceptual and Motor Skills*, 70, 779-782.

Gronlund, G. (1992). Coping with Ninja Turtle play in my kindergarten classroom. *Young Children*, 48(1), 21-25.

Pena, S., French, J., & Holmes, R. (1987). A look at superheroes: some issues and guidelines. *Day Care and Early Education*, 15(1), 10-14.

Symonds, D.(1990). What's so mutant about turtles? *The Bulletin*, August, 122.

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item 12

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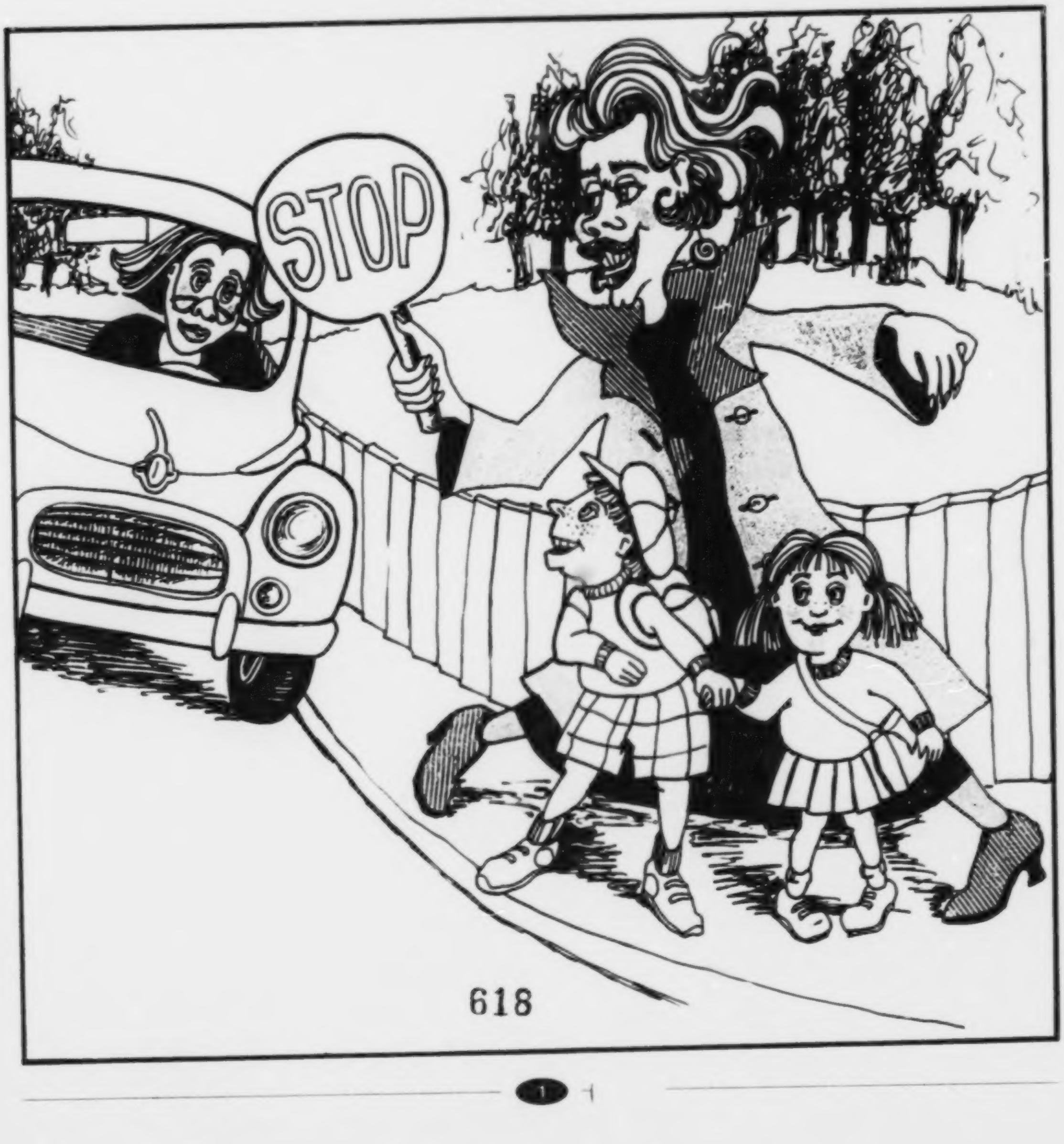
Road Safety Education for Young Children

LEARNING OR PLAYING?

Joy Cullen
Massey University



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Nicola Chadderton

IT IS A COMMON PERCEPTION that young children cannot benefit from road safety education because of their immaturity. This view is not supported by the Western Australian Department of Education which includes road safety objectives in the curriculum for preprimary (K) children. The Federal Office of Road Safety similarly supports the value of road safety education by distributing the *Out and About* resource materials to preschools. A New Zealand report of early childhood injury prevention has also recommended that "educational approaches used with young children should be consistent with and/or part of early education and care centres' programmes".

Several factors place young children at risk in traffic situations. They have poor perceptual skills, naive conceptions of the relationship between distance, time and speed, and limited awareness of danger. Various training procedures have been used to improve the young child's ability to cope with traffic situations. For example, successful training has involved simulated roads to practise skills required to cross roads safely through gaps in traffic, and incentive procedures have been used to increase use of seat belts. Most of these training programmes have been skills-based, have involved intensive use of time and personnel, and have not been integrated with the early childhood curriculum.

In contrast, this project operated as part of the normal teaching programme, using resources available to teachers. The study aimed to evaluate the effectiveness of three play-based methods of road safety education.

The teaching intervention style used during this study adopted a holistic perspective in order to encourage children to develop an understanding of traffic as a system. The theoretical rationale for this approach derived from Ingrid Pramling's phenomenographic perspective on young children's learning. Pramling proposes that children's awareness of learning is increased when they talk about their learning. The reflective dialogue intervention in the study is based on this assumption about the value of talking about learning.

Participants and setting

The road safety programme was conducted in three preprimary centres in Perth. Children were on average 4 years 11 months at the time the study commenced, at mid-year. The teachers who implemented the programme were experienced early childhood teachers. As programmes were sessional, the same teacher in each centre was able to implement two different teaching interventions, one with the morning group and one with the afternoon group. This procedure allowed a natural experiment to be conducted in each centre with control for any teacher or centre effects. Groups did not differ significantly by age.

The Road Safety Programme

The programme operated for a three-week period during the winter term. During the first week, all children were introduced to the same content during mat sessions using posters, songs and the *Out and About* materials from the Federal Office of Road Safety. All children viewed sections of the *Out and About* videotape which featured Australian animal characters in road safety situations and practised road safety skills in realistic settings by going on walks in the local area. Related language and art activities were available for all children. Content was based on the road safety objectives from the Western Australia Health Education curriculum. It covered walking safely in traffic and crossing the road, playing in safe places away from the traffic, the importance of wearing seat-belts, recognition of common road signs, safe use of bicycle paths.

The three play-based teaching interventions (described below) were introduced in the indoor area in the second week and in the outdoor area in the third week.

1. *Learning centre*

An indoor learning centre was available during activity time to stimulate sociodramatic and constructive play on a road safety theme. Indoors, the block area, miniature road safety signs and vehicles formed the learning centre; outdoors, a system of roads, pedestrian crossings and child-sized road safety signs (stop, children crossing, traffic lights) was established. The teacher and assistant were available to extend child-initiated play but did not suggest themes or initiate play. Following the activity time, traffic songs and rhymes were practised in a short mat session.

2. *Reflective dialogue*

The same learning centres were available for this intervention but adults took a more interactive role by talking with children about their play as it took place. Following play, the teacher took a short mat session in which children were encouraged to reflect about their play on a traffic theme. Questions focused on what safety themes they had been enacting, how they had learned the safety information, and how they could use it.

3. *Free play*

Traffic resources were available for children to choose during play but these were not organised as a learning centre and teachers did not direct children's attention to them. Following play there was a short mat session which equated to teacher-directed time. Traffic songs and rhymes were included only if requested by the children.

Assessing intervention effects

Before the teaching programme children were interviewed about their road safety knowledge using photographs of traffic situations as a stimulus. One week after the completion of the programme children were interviewed a second time about what they had learned on road safety. Two months later, children were videoed crossing the road outside the centre, and participated in a felt board story about road safety situations which assessed their knowledge of safety rules and appropriate actions.

There were no significant differences in safety knowledge between the groups before the road safety programme. On the second interview the children who participated in the reflective dialogue intervention recalled significantly more safety knowledge and used more complex reasoning about safety rules than children who participated in the learning centre and free play interventions.

Extracts from the second interview illustrate some of these differences between reflective dialogue (RD), learning centre (LC), and free play (FP) intervention effects. Elaine (RD) considers a safe place to cross the road:

> You walk on the crosswalk but you still have to wait at the cross walk ... for the cars if they're coming. They have to stop, then you cross.

Tom (LC), in contrast, recalls the activity at his centre:

> We made a crosswalk and we had signs out.

Similarly, Robert (LC) recalled:

> Well, we did roadways. Um we had toy cars and straight lines. Um for the people to cross.

Kerry (FP) remembered the video — "Guess what? We saw a wombat and a mouse. They were walking along like pedestrians" — but did not relate these to safety issues. When the interviewer questioned him Kerry recalled actions but did not link these to safety — "They walk along the road and they walk on the footpath."

Asked about safety in the car Terry (RD) talked about using the seat-belt (a topic covered in each centre) and spontaneously referred to use of car locks as an additional safety measure:

> With your seat-belt on and the doors shut with the buttons down. My mum and dad leave their buttons up while they're in the car. I don't. I leave mine down while I'm in the car ... 'cos you might fall out of the seat and out of the door if you don't have your seat-belt on.

Katie (FC) also recalls seat-belt use, "Put your seat-belt on." When asked "Why?" she gave the frequent response, "Keeps you safe if your mum or dad stops suddenly." An LC Child recalled the activity on seat-belts, "We made dough men. They had seat-belts on." After a probe question the child explained that they had seat-belts, "So they don't fall out of the car."

Overall, the reflective dialogue children showed a greater ability to conceptualise about road safety. In contrast, children in the free play or learning centre interventions needed more prompts to recall safety knowledge, and more frequently described activities they had participated in instead of recalling safety knowledge or rules.

Two months later, the reflective dialogue children again obtained higher ratings for their road crossing skills than children in the other interventions. No differences occurred between groups for performance on the felt board story.

> "... Children in the reflective dialogue intervention recalled significantly more safety knowledge... "

How did children learn?

All children in the study had received the same road safety curriculum content in the direct teaching phase of the study yet significant differences occurred between groups on two of the three assessments. What learning processes were affected by the teaching interventions? All children had the opportunity to engage in play but not all children were encouraged to think and talk about their safety-related play. Videotapes of children's play indicate that the reflective dialogue children were more likely to extend their play on traffic themes and to engage in collaborative play than the other children. Language appeared to have an important role in sustaining play. It is plausible that the reflective dialogue children's discussions with adults on their safety play increased their awareness of their safety learning and that this was reflected both in their play and in the subsequent interview in which they talked about their road safety knowledge.

Why did differences not occur with the felt board story enactment of safety actions? The content and method of presentation in this task reflected the direct teaching phase of the programme which all children received. It is likely that at this basic level of knowledge of safety rules the direct teaching approach was sufficient to elicit recall in symbolic situations similar to those used by teachers. The second interview revealed a greater understanding of traffic as a system and it was this aspect which was expected to be affected by the reflective dialogue procedures.

We need to be cautious in interpreting the reflective dialogue children's better performance on the road crossing task. The children were supervised by adults and few cars passed consequently the task did not require complex judgments about traffic. Possibly the adult's presence when children crossed the road cued the reflective dialogue children to focus on appropriate road safety behaviour in much the same way as when adults had directly focused their attention on safety components of their play.

The teacher's role

The videotapes of the reflective dialogue intervention reveal examples of interactive strategies used by teachers to focus children on the learning occurring in their road safety play.

During play

refocussing: (to girl who is walking slowly across cross walk) "You need to walk quickly — you could have got run over then, the lollipop lady has gone."

extending: (joins boy watching 2 boys with trucks on "road" outdoors) "I'll get some chalk. We could make a footpath." (Boy joins teacher and continues marking footpath with chalk, other children help).

After play

questioning what: "What were you doing when you shifted the signs?"

questioning how : "How did the signs make you safe?"

questioning why : "Why did you turn the signs around by the cross walk?"

reflecting: "Yes, the signs remind us where to stop and wait for the traffic to be clear."

Many of the above interactive strategies are the sort of incidental interactions which characterise teaching-learning processes in the early childhood classroom. The main difference in this study is that reflective dialogue teachers consciously looked for appropriate opportunities to interact with children during play and provided a short time for talking and reflecting about the road safety aspects of their play afterwards.

Implications for road safety education

Several implications arise for road safety education in early childhood programmes:

1. Awareness of danger and safe behaviour is an important first step in road safety education. The results of the study indicate that the reflective dialogue procedures in the road safety programme have the potential [illegible] ise young children's awareness of aspects of road safety. The programme did not, however, aim to alter the complex perceptual and cognitive judgments involved in many road safety situations consequently no claim is made that young children can play and cope in traffic without adequate supervision.
2. The study supports the recent interest in teacher scaffolding of young children's learning. The free play provisions in the programme did not focus children's learning on road safety consequently the results of the study provide a challenge to those play-based programmes which de-emphasise learning from adults. Interaction with adults was a major component of the

reflective dialogue intervention. In particular, talking with children about their learning is a way of making cognitive learning explicit.

3. Although the study did not investigate parents' attitudes towards road safety education, the interview data contained some revealing examples of parent influence on children's perceptions of road safety. The parents who crossed the road against the "Don't Cross" sign, for example, would give conflicting messages to children about the use of pedestrian crossings. Effective road safety education is based on children's daily experiences with traffic. Accordingly, early childhood teachers need to keep parents informed about the objectives of road safety education if programmes conducted at preschool are to be effective.
4. Finally, resources such as child-sized traffic signs and the *Out and About* video were valuable in stimulating related play and discussion. If early childhood teachers are to participate in road safety education appropriate resources need to be provided routinely for centres.

Notes

Joy Cullen, previously of Curtin University, is Senior Lecturer of Early Childhood Education, Massey University, Palmerston North, New Zealand.

This article is based on the conference paper:

Cullen, J. (1994, September). *Road Safety Education for Preschoolers—Learning or Playing?* Paper presented at the 20th Triennial Conference of the Australian Early Childhood Association, Perth.

The study described was supported by a grant from the Federal Office of Road Safety, Canberra to Curtin University of Technology, Perth, Western Australia.

A full report of this research is published in:

Cullen, J. (1995). Road safety education at preschool: A reflective dialogue approach. *Journal for Australian Research in Early Childhood Education, 1*, 40-50.

The quote from the New Zealand report on early childhood injury prevention was from page 22 of:

Podmore, V.N., & Lealand, G. (1990). *Hazardous environments: A New Zealand study of early childhood prevention.* Wellington: Accident Compensation Corporation.

The factors which place young children at risk in traffic situations are noted in:

Ampofo-Boateng, K., & Thomson, J.A. (1991). Children's perception of safety and danger on the road. *British Journal of Psychology, 82*, 487-505.

Cross, R.T., & Mehegan, J. (1988). Young children's conception of speed: Possible implications for pedestrian safety. *International Journal of Science Education, 10*, 253-265.

Grieve, R., & Williams, A. (1985). Young children's perception of danger. *British Journal of Developmental Psychology, 3*, 385-392.

Skills based training programmes are reported in:

Ampofo-Boateng, K., Thomson, J.A., Grieve, R., Pitcairn, T., Lee, D.N., & Demetre, J.D. (1993). A developmental and training study of children's ability to find safe routes to cross the road. *British Journal of Developmental Psychology, 11*, 31-45.

Sowers-Hoag, K.M., Thyer, B.A., & Bailey, J.S. (1987). Promoting automobile safety belt use by young children. *Journal of Applied Behavior Analysis, 20*, 133-138.

Young, D.S., & Lee, D.N. (1987). Training children in road crossing skills using a roadside simulation. *Accident Analysis and Prevention, 19*, 327-341.

The theory that children's awareness of learning is increased by talking about learning is developed in:

Pramling, I. (1990). *Learning to learn: A study of Swedish preschool children.* New York: Springer-Verlag.

The Australian road safety material is from:

Federal Office of Road Safety (1991). *Out and about - Preschool.* Canberra: Dept of Transport.

Teacher scaffolding of young children's learning is discussed in:

Fleer, M. (1992). *From Piaget to Vygotsky: Moving into a new era of early childhood education.* In B. Lambert (Ed.), Changing faces: The early childhood profession in Australia. Watson, ACT: AECA.

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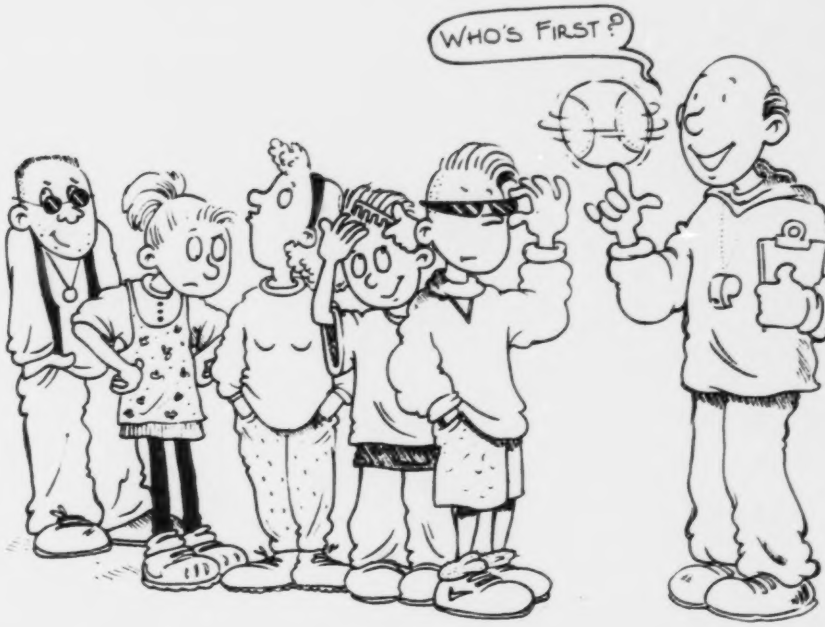
Constructing adolescent bodies:

SOME PROBLEMS FOR HEALTH PROMOTION THROUGH PHYSICAL EDUCATION

David Kirk
Deakin University (Geelong Campus)



Jennifer Lautusi

For all of the boom in fitness and training, not many of us are lean, bronzed or rugged. In fact, though we've never been healthier, we've never looked worse. Men look like apples, women look like pears. And that's the way it's going to be. (Gary Egger, "The Apple and Pear Generation", The Bulletin, 1991)

THE BODY has recently become a fashionable topic in both the scholarly literature of fields such as sociology, philosophy, cultural studies and education, and among journalists servicing the popular print and electronic media. Part of this interest in the body stems from the increasing visibility of aspects of physical culture in our everyday lives, including such "pastimes" as media sport and the pursuit of health and fitness. Television and magazine advertising has brought the body to prominence, as has the continuing influence of the fashion industry and developments in cosmetic surgery.

The body in nature/culture

What does it mean to suggest that the body is in culture as well as in nature, and that bodies are socially constructed? It has been argued that the body in culture plays a pivotal role on the formation and maintenance of self-identity, in our understanding of who we are and of our place/s in society. A child does not learn that it "has" a body, because self-consciousness emerges through bodily differentiation rather than the other way around. Children learn about their bodies in both physical and social environments, in relation to objects and other people. This means that our bodies are not in everyday, routine life experienced as "things"; they are, rather, our practical mode of engagement with a range of external events and situations. Moreover, it is only through relentless and continuous monitoring of our bodies and their expressive capabilities that we successfully engage in social activity.

The maintenance of normal social activity depends on the more or less successful integration of self-identity and body. Bodies are constructed through social processes of learning and interaction. We learn what are considered to be acceptable facial and other physical gestures, bodily comportment, body adornment and decoration and a host of other physical acts as these are defined by particular groups and communities. We learn how to communicate and conceal information through our actions.

Physical appearance is not only widely utilised as a means of summing up a person's character, but body shapes have become symbols, signifying particular social values. At the present time in Australia certain degrees of slenderness and muscularity are generally looked upon favourably and are considered to signify (among other things) health, capability, self-control and sexual attractiveness, especially with respect to the female body.

Too much muscle, however, is more likely to be regarded with revulsion by many people, especially in the case of body builders where the self-absorbed attention paid to the body is thought to signify narcissism. Fatness, especially extreme obesity, is also regarded with revulsion, and is considered to symbolize slothfulness, poor health, greed and lack of self-control, although there is considerable difference of opinion among writers on these topics concerning the legitimacy of such interpretations. In other words, flesh-and-blood bodies take on particular meanings. Bodies tell stories about self, they convey sets of ideas and values. Bodies are read and the signs they emit are interpreted by each of us, in the normal course of our daily lives, as a means of discerning the kind of person we are encountering.

Body shape is just one example of the very many ways in which the body is in culture and nature simultaneously. Skin colour and racial characteristics are other features of bodies which also, at the same time as they are biological facts, have cultural significance. Particular ways of walking, carriage and comportment, all manner of bodily movements are interpreted and made sense of in everyday situations. Much of the time, the signs bodies emit may be neither explicitly communicated nor consciously interpreted. Making sense of bodies is part of routine social behaviour.

Adolescents' constructions of bodies

By adolescence (11-18 years old) most individuals have already acquired a considerable range of physical competencies and a high level of awareness of the kinds of bodily activities regarded as acceptable and normal. Engagements with popular culture are frequent for most adolescents and, perhaps more than for most other age groups in Australia, are significant in the formation of self-identity. However, for many children, the dramatic changes wrought by the onset of puberty are sufficient to destabilise even well established and sedimented notions of physical normality. Adolescence is therefore a period in the lifecycle in which there is often acute awareness of the body as a material manifestation of self-identity.

The school physical education lesson, celebrated by some students and dreaded by others, is one place where adolescents have to negotiate the process of constructing their bodies. An individual's passage through a physical education lesson requires a series of strategic negotiations in relation to the actual physical tasks set by the teacher, interactions with other students around these tasks and, more generally, occupation of the spaces in which these tasks are to be performed.

Negotiating a badminton lesson

The following observations are of a physical education lesson in a secondary school in the Geelong area. It demonstrates the complex processes of negotiation which surround the construction of bodies, and particularly how these negotiations are conditioned by the culture of the school itself. The focus of this example is on the contrasting positions of boys and girls and their engagements with the physical tasks which form the substance of the lesson. (All names and identifying characteristics have been changed).

> *Badminton lesson, Year 8* (13 year-olds): This is the second badminton lesson the teacher, Freda, has had with this class. As we walk into the hall at the start, she points out to me that the boys have been watching *Karate Kid* on the weekend; five of them are standing together with arms raised above their heads, hopping from one foot to balance on the other, sending out a kick in mid-air in between.
>
> The boys are dressed with the greatest variation (vests, t-shirts, different colour and kinds of shorts) while all of the girls except for three sitting out are in different coloured tracksuit pants and long, baggy sweatshirts that come down to the tops of their legs. The class activity begins with a warmup, the girls going down one side of the hall, the boys down the other, running, hopping, side-stepping, etc. Then some pressups and situps, and some stretching. All students are working fairly hard, huffing and puffing by the end of the running part.
>
> Freda then seats the class, selects two girls and two boys (boy/girl in each team) and proceeds to set up a demonstration of some elementary principles of the game. While the students on court play she points out each rule. (One of the boys, Greg, slashes the air in short, sharp strokes the whole time the shuttle is out of play or while Freda is talking, and clearly finds this very pleasurable.) The students sitting down seem attentive. But when, after about 15 minutes of instruction in this demonstration mode they set up a game themselves, only the demonstrators try to continue to play as they've just been shown. Freda sits down along side the girls sitting out and busily begins to write notes in her folder. She gives no further instruction, and simply supervises the play very loosely it seems. The students' abilities range widely, more girls generally at the less able end of the scale. The games settle down, but the students show little enthusiasm for the rules they've just been taught. They hit the shuttle with gusto, but mostly with little serious intent (in terms of playing the game). The act of hitting hard, of swiping the shuttle, seems to be the main pleasure to be gained here.
>
> The students are extremely vocal. This is especially so with the boys, who argue and bicker constantly among themselves over whether shots were in or out. The style of an all-boys game contrasts sharply with an all-female game on the middle court. The boys throw themselves around and take the competition very seriously. Even so, their shots are often wild, hit hard for the sake of being hit hard. The boys seem to have little sense of fair play. No quarter is given to their opponents; if the outcome of a play is marginally contestible, they will do so vigorously. There is no logic or reasonableness in these disputes most of the time. In fact, the pair who triumph are often the boys who can shout the others down.
>
> The all-girls game has none of these features. The girls play at a very sedate rate, and clearly it is not cool to show that you are serious, trying hard or moving vigorously. They are compliant but not enthusiastic when playing together. They are also tolerant of each others' failings, in contrast to the boys who frequently abuse each other on the same team. Each of these girls is dressed well, two of them almost elegantly, with hair neatly tied in a pony-tail. I doubt if they would have broken sweat, at least not since the warmup. Their game is played at half the speed of the boys'. The girls seem keen not to display more than a low level of interest and ability, just enough to get through the lesson.

This account is necessarily selective, though I suggest it is representative of much standard, everyday physical education teaching. Within an institutional context, physical education lessons, like most other aspects of the day-to-day life of the schools, become routine. This routinisation leads, as this account demonstrates, to a range of levels and modes of engagement and disengagement in the tasks that ostensibly provide the justification for the lesson's existence. We might want to argue that we are witnessing in students' behaviour facades or fronts which form part of a protective strategy of the self.

This institutional context does much to shape the ways in which students and their teachers engage during a lesson. We can see that boys and girls, in general terms, are positioned and position themselves differently in terms of their physical engagements. Boys seem to occupy more space, and they do this more vigorously than the girls. The girls (with only a few exceptions) generally seem more concerned than the boys to comply with the tasks but often at a minimal level and with little enthusiasm, thereby delimiting the risks to themselves in terms of exposure of their physical competencies or the possibility of being out of sorts with their teacher. These differences are apparent in the ways in which boys and girls generally dress, the boys in relatively tight clothing which reveals body shape, the girls in loose, baggy dress which could be interpreted as an attempt to disguise their actual shapes.

These different ways of participating in this physical education lesson are also conditioned by the lesson's interactive character, by the sheer necessity to engage the physical tasks in the presence of others. Much of the boys' interaction with other boys and with girls, might be described as boisterous and "playful", whilst the girls generally tend to be more considerate of each other and certainly less confronting in their interactions.

Interviews held with 200 secondary school students in the five schools in the Geelong area confirm the assumptions made from the observations of the badminton lesson. For instance, during interviews at a Year 10 class in a co-educational school, one female student remarked:

> I think society has kind of made girls feel inferior. And they think they have to live up to a standard. I know that's how I feel. Because you hear guys talking all the time, and they expect you to look like models and have a marvellous body and you just feel really bad. It's like they have their expectations too high and it just makes you feel really bad about yourself.

This observation captures a key feature of the different ways in which boys and girls construct themselves and are in turn constructed within physical education lessons. In the case of some girls interviewed, the adornment of their bodies with designer-labelled leisure clothing may be regarded as a strategy of disembodiment, a form of protection of themselves and their self-identities. Such a mode of dress assures their status as normal, as someone who looks acceptable. It also obscures their shape, making their bodies less easy to discern whilst they are on the stage of the physical education lesson and, as such, this strategy perhaps can be regarded as a form of disguise, a way of concealing the real them.

While girls may develop strategies which counteract their objectification as spectacles for visual gratification; boys, on the other hand, seem preoccupied with the display of their physicality. As a number of Year 10 female students pointed out, boys are more likely than girls to be interested in the overt display of their own and others' muscularity and physical prowess.

The notion that masculinity is associated with muscle or strength, strenuous physical activity and the occupation of space has been noted by various researchers, as well as being confirmed by my account of the badminton lesson. We cannot assume however that the construction of the normal male body as big, strong and capable of vigorous physical work is accepted uniformally or unproblematically by male students. The following conversation with a Year 10 male student from a co-educational community college illustrates the difficulty of generalising about a normal or even ideal male body.

> *Researcher*: If you had the choice of a build for the sort of activity you're interested in, what would you look like?
> *Stephen*: Oh, probably for football I really wouldn't want to be that tall, just about 5'10"- 11" . Under the 6' mark and just be all muscles. Like you look at Tony Libratore. He's not big but his legs and that are massive ....
> *Researcher*: Yeah, he's pretty solid isn't he? But he's only 5'5" or something like that, which is small. What about Gavin Brown ? Now Gavin Brown would only be about 5' 11" ...
> *Stephen*: Oh, most of the wingies they are really 6' and 6'1"
> *Researcher*: Name a player, someone from North Melbourne that ... who would you?
> *Stephen*: Roth ... have you seen him?
> *Researcher*: Yeah.
> *Stephen*: He's big. He's not that tall. Larkins.
> *Researcher*: Yeah. Oh, well Matthew Larkins's got legs like that.
> *Stephen*: Yeah. (laughter) Yeah they're all ... they're all huge. They really are. A lot of them are when you get into it.
> *Researcher*: Oh, so 5'11" and pretty solid is what you'd ...
> *Stephen*: Yeah. But you look at players like David Bain and that Sydney Swans player ...
> *Researcher*: Oh, yeah, they're awesome!
> *Stephen*: Yeah. You have a look at them. They're not big.
> *Researcher*: No not at all.
> *Stephen*: So, you know ... oh I don't know .... it depends like he .... David Bain is one of the best footballers I reckon and you look at him. He's not really solid, not big.

This interview reveals some of the ambiguity surrounding Stephen's negotiations of the dominant characteristics of maleness applied to his own self-identity, there is nevertheless a clear line between being considered by one's peers to be normal and otherwise.

Issues for health promotion through physical education

Popular physical culture saturates the cultural environments in which these young people live. Two things emerge from their actions and conversations. The first is that many aspects of physical culture, particularly those relating to bodies and represented through television and magazines, are a continuously present resource which provide students with points of reference for themselves and orientations to each other. Whether they are acting out episodes from the *Karate Kid*, discussing the latest awesome physical feat in a football match, admiring Schwarzenegger's physique or following exercises from *Cleo* or *Women's Weekly*, these adolescents are consumers of the products and commodities of popular physical culture. In this respect, they are party to the construction and legitimation of notions that slenderness, for instance, is a sign that an individual is fit and, by imputation, healthy, or that muscularity in women denotes masculine tendencies.

What does this analysis of adolescents' construction of bodies imply for health education and promotion? If many girls and some boys are indeed experiencing disembodiment in their physical education lessons and other encounters with popular physical culture, as a strategy for protecting or defending their self-identities, what alterations need to occur to school programmes and to our thinking about health education and promotion to allow these individuals to gain the positive benefits of active lifestyles?

I suggest that young people have the information required to lead a healthy lifestyle but, particularly in schools, are too often presented with situations in which it is extremely difficult to put this knowledge into practice. In other words, the source of the problem of health promotion, in these sites at least, is a failure to understand how engagement in physical tasks exposes the body and thus places self-identity at risk. Indeed, I suggest many girls and some boys may often experience levels of disembodiment in physical education lessons as they attempt to negotiate their way through the physical tasks they are set without transgressing normative standards or exposing themselves through the possibility of revealing their physical competencies. If this is the case, then schools need to amend and in some cases radically alter their practices if they are to be sites of health promotion, particularly in relation to education in, through and about physical activity and exercise.

Firstly, schools need to establish programmes which proactively debunk and demythologise various aspects of popular physical culture which present idealised and glamourised images of female and male bodies. In so doing, through this cultural critique, they need to demonstrate the range of healthy bodies and ways of being embodied available in and acceptable to Australian society, including acceptable ways of being feminine and masculine. These programmes might be run across school subjects where teachers are prepared to attend to, engage and critique popular culture.

Secondly, schools need to alter their physical education programmes, in terms of content, pedagogy and organisation, in ways that will make them more gender-sensitive. While there has been continuing expansion of the range of available activities which constitute physical education programmes in Australia, many continue to be dominated by traditional activities like athletics and major team games. In contrast, a survey conducted as part of this research revealed that only 40 percent of respondents nominated team sports as the activity they most like to do in their own time, with boys accounting for 60 percent of these students. Moreover, as students get older, their involvement in team sports decreases substantially, falling steadily from 54 percent of 11 and 12 year olds to 32 percent of 17 and 18 year olds. Participation in physical activities specifically for fitness purposes shows an increase, from around 20 percent of the younger students to 40 percent of the senior students.

The pedagogy of school physical education programmes also needs to change. A new approach to the organisation of programmes is required. A greater degree of choice of activity for students, some of which might be taken up in community sites such as local recreation and exercise clubs, would certainly come closer to matching students' diverse interests in physical activity and increasing disinterest in a diet of team sports. Moreover, given the relatively intimidating environment physical education lessons present for many girls and some boys, perhaps schools could offer students the choice of participating in single-sex lessons. Those girls who wish to participate with boys could do so, but those who wish to opt for girls-only lessons could be catered for also. Students might also gain credit for some activities run on a single-sex basis by attending a local gym or engaging in a programme of activity provided by other external agencies rather than participating in school physical education lessons.

Third and finally, I suggest health promotion agencies beyond schools need to begin to pay more attention to the specific contexts in which the information they disseminate is expected to be used by individuals. Exhortations to lead a more healthy lifestyle make little sense in the abstract. The notion of a healthy lifestyle only makes sense when it can be shown more or less precisely what this means in any given set of circumstances. Even in the relatively controlled environment of school physical education, the possibilities of practising health-related activities is narrowly circumscribed because of the institutional nature of schooling, because of students' interpretations and appropriations of popular physical culture, and because of the social dynamics of groups of female and male adolescents.

In less bounded situations, what counts as a healthy lifestyle becomes even more problematic. It seems to me that health education, particularly where physical activity is involved, is only ever likely to be successful if health promoters are able to create circumstances in which individuals can engage in physical tasks without risk to self-identity. Since, in contemporary Australian culture, character is inherent in appearance, we need to be developing highly contextualised, ecologically valid programmes of health promotion in which the embodied self is not merely protected, but is actually enriched, extended and empowered.

Notes

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The Course Experience of Year 12 Students

Results from *Youth in Transition*

Michael Long and Lyn Robinson
The Australian Council for Educational Research

MORE AUSTRALIAN SECONDARY STUDENTS are staying at school to complete Year 12 (Form 7). Retention to Year 12 has more than doubled from a little under 35 percent for much of the 1970s and peaked at 77 percent in 1992. This is one of the most significant changes in the history of Australian education. Together with increased participation in tertiary education, the increase in the number of young people completing Year 12 signifies a move toward mass post compulsory education.

Equity in education is a recurring theme in government policy. One of the ten *Common and Agreed National Goals for Schooling in Australia* includes the phrase *To promote equality of educational opportunities...* The Commonwealth Government operates the *National Equity Program for Schools* (NEPS) which includes the broad goal of *[ensuring] that the range of outcomes from schooling for students in the target groups approaches the same range of outcomes as for the non-target group.* The targeted groups include students from low socio-economic or non-English-speaking backgrounds, Aboriginal and Torres Strait Islander students, students who are geographically isolated and students with disabilities.

Learning environments influence learning outcomes. Good teaching and clear course goals and standards lead to better academic outcomes. Workload and assessment influence the style of learning — surface or deep approaches to understanding — which in turn affect learning outcomes.

The quality of the learning environment addresses an aspect of equality of opportunity rather than of equality of outcome. It is generally more difficult to measure the quality of learning environments than completion rates or academic results and requires the use of students' perceptions of their courses.

There is likely to be substantial individual variation in students' perceptions of their courses. If, however, there is systematic variation in perceptions between various sub populations of students then there may be implications for equity in post compulsory secondary education. This paper explores the extent of differences associated with gender, socio-economic status, ethnicity, rurality and level of school achievement.

Youth in Transition

Youth in Transition is a longitudinal study that has been conducted over the past seventeen years by the Australian Council for Educational Research. It now involves four national cohorts of people, designated by their year of birth as the 1961, 1965, 1970 and 1975 cohorts. Members of these cohorts receive an annual mail questionnaire about participation in education and work.

The findings presented here are for the cohort born in 1975. Some 5 653 14-year-olds were initially contacted in their schools in 1989 when they completed achievement tests in reading and mathematics, as well as a questionnaire. At that time, sample members were spread across Years 8, 9 and 10 — although the majority were in Year 9. Sample members have been surveyed annually since 1989.

In 1992, when the majority of the members of the 1975 cohort were in Year 12, the annual questionnaire (administered at the end of the year) contained a section which asked respondents about their experiences of the course they had been doing during that year. There were 3 957 respondents to the survey in 1992, of whom 2 153 were in Year 12.

These data permit an examination of the experiences of Year 12 of a national sample of young people. As well as information on their perceptions of their course, other contextual information about the students' family background and their earlier school achievement was available from previous surveys. The course experiences of these respondents can be reported both for the group as a whole, and for sub populations categorised by gender, ethnic and social background and location.

Students' perceptions of their courses

There is an extensive literature on student evaluation of their learning environments, although more commonly at the tertiary level. Student evaluation of particular units of study and of the teaching of individual staff is now routine in many universities, both in Australia and internationally. The set of items included in the *Youth in Transition* questionnaire were selected from the *Course Experience Questionnaire*, versions of which have been developed and tested over a number of years by Ramsden and colleagues.

Table 1

Percentage Responses, Means and Standard Deviations for Course Experience Items for Year 12 Students in 1992

Item	always true %	frequ- ently %	half- time %	some- times %	rarely true %	Mean %	Std. dev.	No. of Resp.
1 There were few opportunities to choose particular topics you wanted to study	17	21	18	24	20	48	34	2077
2 The workload was too heavy	10	25	26	32	7	50	28	2103
3 You usually had a clear idea of where you were going and what was expected of you	28	36	21	12	4	68	28	2102
4 To do well in this course all you really needed was a good memory	9	15	26	29	21	40	30	2101
5 In most classes we were able to work through what we had to learn in the way that suited us best	10	23	29	24	15	47	29	2101
6 Teachers seemed more interested in testing what we had memorised than what we had understood	9	13	19	27	31	36	32	2102
7 It was often hard to discover what was expected of you in the course	8	12	22	31	28	35	30	2094
8 We were generally given enough time to understand the things we were learning	11	28	26	24	12	51	29	2097
9 Teachers made a real effort to understand difficulties students had with their work	24	31	21	15	8	62	30	2094
10 The aims and objectives of the course were not made very clear	5	11	20	29	35	31	29	2103
11 Teachers put a lot of time into commenting on students' work	10	22	28	25	15	46	29	2100
12 There was a lot of pressure on you as a student	42	27	16	11	4	73	29	2098
13 We often discussed with teachers how we were going to learn in the course	6	18	23	27	25	38	30	2095
14 It would have been possible to get through the course just by working hard around exam time	7	10	14	20	49	26	32	2096
15 Teachers made it clear right from the start what they expected of students	25	28	23	18	6	62	31	2096
16 We were encouraged to develop our own academic interests as far as possible	22	28	27	13	10	60	30	2093
17 Feedback on student work was usually provided *only* in the form of marks and grades	18	21	20	23	18	50	34	2091
18 Teachers were extremely good at explaining things to us	10	25	36	21	8	52	26	2088
19 Teachers worked hard to make their subjects interesting to students	12	27	32	20	9	53	28	2098
20 The sheer volume of work to be got through in the course meant that you couldn't comprehend it thoroughly	14	21	28	28	10	51	29	2096

Responses to items in the course experience questionnaire

Table 1 shows the 20 statements about their courses to which members of the 1975 *Youth in Transition* cohort were asked to respond in 1992 when they were 17 years old. The items cover four aspects of the learning environment: the quality of teaching, the clarity of goals and standards, assessment and workload. Students were asked to indicate the extent to which each statement was true of the course they had recently completed.

The percentages of Year 12 students who gave each of the five possible responses are displayed in Table 1 for each item. For instance, for the first item, *There were few opportunities to choose particular topics you wanted to study*, 17 percent believed that this was always or almost always true, 21 percent believed that it was frequently true, 18 percent believed that it was true about half the time, 24 percent believed that it was sometimes true, and 20 percent believed that it was rarely true.

The means and standard deviations in Table 1 assume that *Always true* indicates that a statement was true 100 percent of the time, *Frequently true* indicates 75 percent, *True half of the time* indicates 50 percent of the time, *Sometimes true* indicates 25 percent and *Never or rarely true* corresponds zero percent. The result is a mean which has a fairly direct interpretation as the percent of time the item was true. For instance, the mean for the first item in Table 1 is 48 and can be interpreted as meaning that on average the statement *There were few opportunities to choose particular topics you wanted to study* is true 48 percent of the time.

The means shown in Table 1 are a convenient summary of the responses for each item and facilitate comparison between items. For instance, Item 9, *Teachers made a real effort to understand difficulties students had with their work*, was judged to be true 62 percent of the time. By comparison, Item 11, *Teachers put a lot of time into commenting on student's work*, was judged to be true only 46 percent of the time.

The statement endorsed by respondents as being most frequently true of their Year 12 course was Item 12, *There was a lot of pressure on you as a student*, which has a mean of 73. It did not seem that this pressure was necessarily restricted to exams, because Item 14, *It would have been possible to get through the course just by working hard around exam time*, received the least support with a mean score of 26.

The other main feature to emerge from the results in Table 1 is that students have a fairly good idea of what is expected of them in Year 12. Two statements that were among those with the highest mean scores related to students having a clear understanding of what was expected of them: Item 3, which had a mean score of 68, and Item 15, with a mean of 62. On the other hand, two of the lowest mean scores were for other statements about aims and objectives being unclear — Items 10 and 7, with mean scores of 31 and 35 respectively.

Differences between categories of students

The value of instruments such as the *Course Experience Questionnaire* lies more in comparisons between groups of students rather than in reflections on the extent to which particular activities were perceived to occur. This section explores differences in students' perceptions of their learning environment associated with:

- ❑ ***Gender***
- ❑ ***Socio-economic status*** – a composite index based on the prestige of the occupations of respondents' fathers and mothers, the level of education of fathers and mothers, and a family wealth index derived from respondents' reports on the nature of their accommodation and on the possession of certain consumer durables. Scores for the scale were then divided into quartiles and the middle two quartiles were combined.
- ❑ ***Ethnic background*** – based on father's country of birth. Countries are broadly classified as Australia, other mainly English-speaking country, and non-English-speaking country.
- ❑ ***Rurality*** – measured by the population density of the local government area in which the school the respondent attended in 1989 was located. The distribution of densities was divided into quartiles with low population densities being defined as "rural" and the other three quartiles as "urban".
- ❑ ***Achievement*** – measured by standardised tests in literacy and numeracy that were administered to sample members in 1989 at age 14. A composite achievement score was produced and then divided into quartiles and the two middle quartiles were then combined.

We have chosen four items from Table 1 as exemplars of the quality of teaching, the clarity of goals and standards, assessment, and workload respectively:

- ❑ *Teachers were extremely good at explaining things to us.*
- ❑ *You usually had a good idea of where you were going and what was expected of you.*
- ❑ *To do well in this course all you really needed was a good memory.*
- ❑ *We were generally given enough time to understand the things we were learning.*

Table 2 presents means for these four items categorised by the student background variables. The values in these tables allow a discussion of the extent to which there is a systematic variation in course experience based on the background characteristics of students. If means for the course experience items vary significantly across categories of students according to their personal or family background there may be issues of educational equity.

Table 2

Mean Percent of Time for Selected Course Experience Items by Gender, Socio-economic Status, Ethnicity, Rurality and School Achievement

Background Characteristics	Good Teaching %	Clear Standards %	Appropriate Assessment %	Appropriate Workload %	No. of Respondents %
Gender					
Male	51	67	40	51	846
Female	53	68	40	50	1256
Socio-economic status					
High	55	70	35	53	631
Middle	51	68	41	50	949
Low	51	64	47	49	412
Ethnicity					
Australian-born	52	69	40	50	1369
English-born	52	68	42	51	258
Non-English-born	55	65	41	51	374
Rurality					
Rural	49	68	40	50	464
Urban	53	67	41	51	1638
School achievement					
Highest 25%	54	70	39	52	804
Middle 50%	51	66	41	48	1062
Lowest 25%	50	67	42	55	235

Notes

1 *Good Teaching* is measured by *Teachers were extremely good at explaining things to us.*

2 *Clear Standards* is measured by *You usually had a good idea of where you were going and what was expected of you.*

3 *Appropriate Assessment* is measured by *To do well in this course all you really needed was a good memory.*

4 *Appropriate Workload* is measured by *We were generally given enough time to understand the things we were learning.*

Results

Gender. There are no differences between the course experiences of male and female Year 12 students. Males and females report the same extent of good teaching, clear standards, appropriate assessment and appropriate workload. While perceptions may not be the same as reality, there is little in these results to support calls for schools to be made more *girl-friendly*.

Socio-economic status. Year 12 students from higher socio-economic status families reported that they experienced good teaching and clear goals and standards more frequently than students from lower socio-economic status families. Although the differences are small — four and six percentage points respectively — they are nevertheless statistically significant (at 0.05, two-tailed). Students from lower socio-economic families were also more likely to report learning environments conducive to surface rather than depth learning — assessment based on memory and insufficient time to understand what they were learning. Again, the difference was statistically significant in both instances. In the case of assessment the difference between students from high and low status families was a relatively large twelve percentage points, but only four percentage points for workload.

Ethnicity. None of the differences based on father's country of birth is statistically significant. It is interesting to note, though, that Year 12 students whose fathers were born in a non-English-speaking country report the highest level of good teaching, but the lowest level of clarity of standards.

Rurality. Again, none of the differences between Year 12 students from urban and rural students is statistically significant. The higher frequency of good teaching for urban students, however, approaches statistical significance (p=0.06).

School achievement. The differences between categories of school achievement are statistically significant for all of the four indicators presented in Table 2. The differences indicate that students in the higher quartile of school achievement experience good teaching and clear goals and standards more frequently than other students. Higher achieving students are also less likely to experience assessment based on memory. It is interesting too that those students who would normally be thought of as requiring more time to understand material reported a higher frequency of having sufficient time to learn that material. The pattern here, however, is curvilinear. The students who reported having least time to understand the material they were learning were those from the middle two quartiles.

Summary

This paper has reviewed the responses of a national sample of Year 12 students to 20 items which related to the learning environment in their final year at school. It was suggested that access to a productive learning environment was an issue of equity. Four items were selected as indicators of good teaching, clear goals and standards, appropriate assessment and appropriate workload respectively. Mean scores for these four items were presented for categories of five student background characteristics: gender, socio-economic status, ethnicity, rurality, and school achievement.

It was found that there were no statistically significant differences between male and female students, between categories of students defined according to father's country of birth, or between urban and rural students. In these cases the absence of any difference is an indicator of reasonably equitable exposure to productive learning environments.

Students from lower socio-economic status families reported that they experienced lower levels of good teaching and less clarity of course goals and standards. They were also far more likely to report that memory was all that was required in order to do well in a course. This result echoes other findings that students from lower socio-economic status backgrounds are more likely to use surface approaches to learning. It may be that this result is due to aspects of family culture brought to the school environment rather than to any difference in assessment. This finding, suggests, however, that special attention may need to be given to the approach taken to learning by students from lower socio-economic backgrounds. The more frequent experience of insufficient time to learn the required material probably compounds this effect. It is possible that these results are associated with the differences observed for achievement.

The higher levels of experience of good teaching and clarity of course goals and standards by higher achieving students is interesting. It may reflect real (rather than perceived) differences in experiences of good teaching due to streaming and criteria used to allocate teachers between classes. If it simply reflects perceptions, then this result has implications for the use of the course experience questionnaire in the higher education sector. It becomes a little less tenable to claim that a particular course has lower reported levels of good teaching than another course because it has "brighter" (and allegedly more critical) students.

Higher achieving students are less likely to report that memory was all that was required to do well in Year 12. The intriguing result, however, is the relatively high level at which lower achieving students report having sufficient time to understand the material they are studying. Again this may reflect some form of streaming, possibly implicit in subject choice, so that students with lower levels of early school achievement choose, or are directed towards, less demanding courses.

Notes

Michael Long and **Lyn Robinson** are researchers working at ACER on the *Youth in Transition* project.

Statistics for the retention rates are from:

Australian Bureau of Statistics. (1994). *Schooling Australia 1993*. Canberra: AGPS.

The quotes on government policy are from:

Department of Employment, Education and Training (DEET). (1994). *National Equity Program for Schools (NEPS): Compendium of 1994 Agreements*. Canberra: DEET.

Figures on differences between Year 12 completion rates during 1980s are from:

Williams, T., Long, M., Carpenter, P. & Hayden, M. (1993). *Year 12 in the 1980s*. Canberra: AGPS.

Measuring the quality of learning environments in higher education sector is reported in:

Ainley, J. & Long, M. (1994). *The Course Experience Survey 1992 Graduates*. Canberra: AGPS.

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Ramsden, P. (1985). Student learning research: Retrospect and prospect. *Higher Education Research and Development, 4*, 51-69.

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item 15

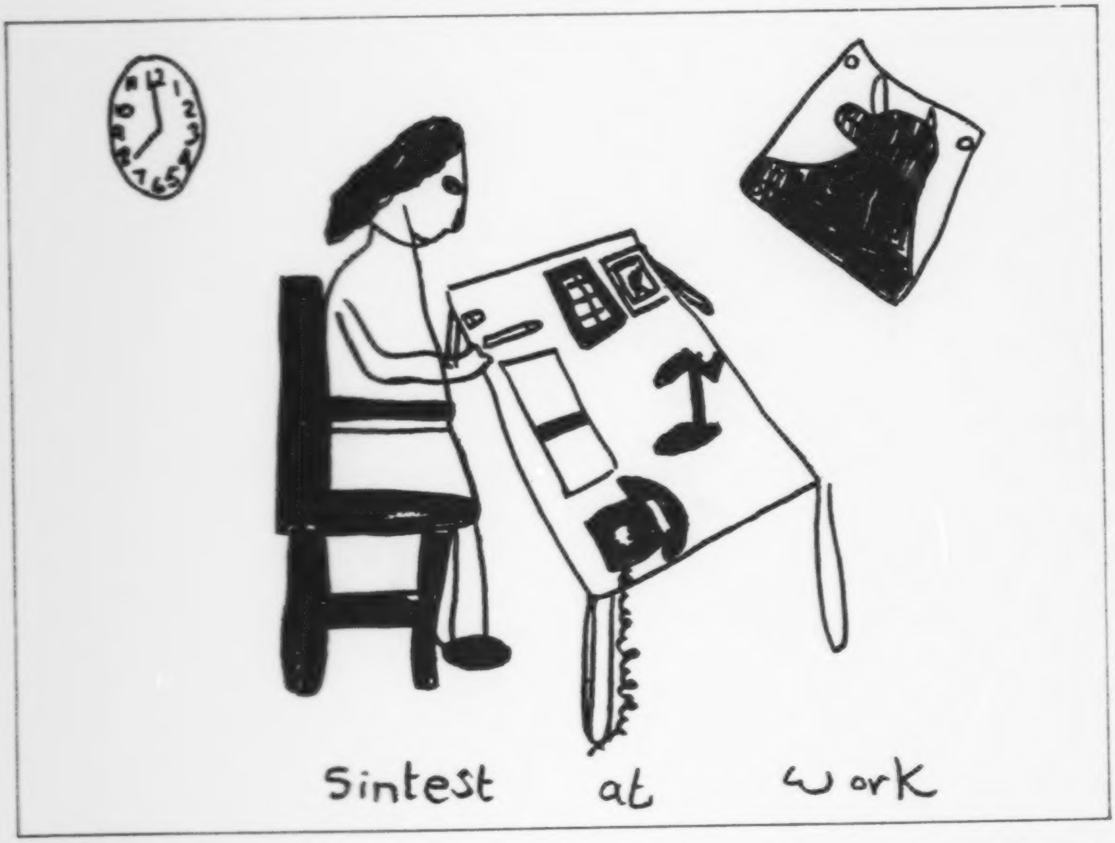
set
number two 1995

The Draw-a-Scientist Test

WHAT DO YOUNG CHILDREN THINK OF SCIENCE AND SCIENTISTS?

Lynn Newton and Douglas Newton

University of Newcastle



Scientist by a 10-year-old girl. An uncommon depiction of a female scientist, in this case seated at a desk which has a microscope on it.

WHAT CHILDREN THINK ABOUT SCIENCE and the scientist may shape what they do when they are older. In adolescence these perceptions of science and the scientist are a factor in determining career choice.

In recent years, studies in the United States, Canada, Australia and the Republic of Ireland have shown that children share a view of the scientist as being bald, having a beard, wearing spectacles and a white coat, and being male. Chambers' study in Canada was based on a Draw-A-Scientist Test. Since this does not require verbal facility, it can be used with very young children to determine their image of the scientist. Schibeci and Sorenson, in their study of Australian children, found the test to be very useful, since it required little time and seemed to minimise the likelihood of "socially desirable responses". These studies point to stereotypes forming as early as seven or eight years of age.

According to North American children, the most likely activity of a scientist is inventing, followed by being a biologist, then a chemist "with beakers and bubbles", and finally a physician.

This image of the scientist and the scientist's work has shown itself to be fairly stable but is not universal. For instance, in Thailand chemistry is seen as being a female pursuit. In other words, children's perceptions of science and the scientist are shaped by the prevailing culture. To the degree that the prevailing culture is stable then the children's perceptions are stable.

The Draw-A-Scientist Test

Applying the Draw-A-Scientist Test is easy. Children are asked to draw a picture of a scientist, taking care to note those for whom "scientist" is meaningless. It is best to give the test to younger children in groups of about four so that they can be asked about the attributes of the scientist they have drawn. The task has no time limit. Care has to be taken not to signal any expectation when the task is set. We gave this test to 1143 primary age children (4+ to 11+ years old) from 80 schools in England. Attributes of the figure (such as sex, appearance, attire) were recorded. Attributes of any background (such as equipment, whether the activity was indoors or outdoors) were noted.

The children's scientists

Boys of all ages drew predominantly male figures. This comes as no surprise since they might be projecting themselves into their pictures. The girls drew predominantly female figures until they were about six years old. After that, male scientists predominated for girls as well, amounting to over 80 percent of the figures by the time they were 11 years old.

We checked that this was not just a normal tendency when drawing figures of people by asking a separate group of 200 children to do a Draw-A-Person Test. Boys drew predominantly male figures while girls drew predominantly female figures.

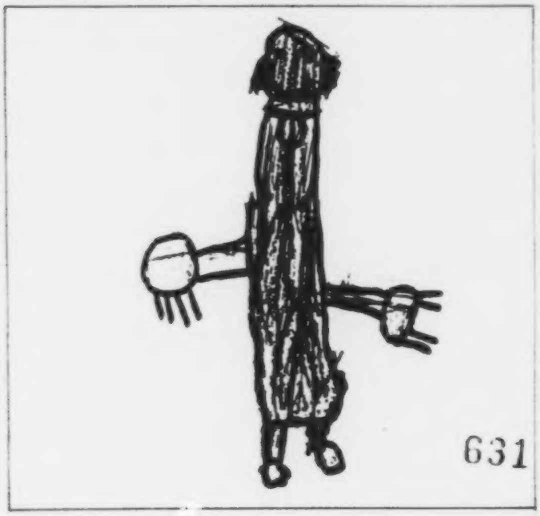
The older the children, the more likely it was that both boys and girls would give their scientists a "special" coat. Over half of the 11-year-old boys and girls gave their scientists white coats. Like laboratory coats, boys and girls tended to give their scientists spectacles as well.

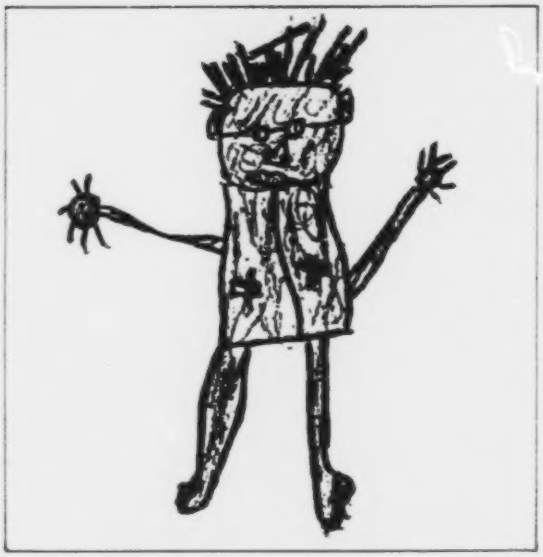
Children older than six years of age were increasingly likely to draw beards on their scientists as we moved up through the age range. About one-third of the older children, boys and girls, drew scientists with beards. The children similarly tended to draw their scientists as bald or balding. About one-third of the 11-year-old boys and two-thirds of girls drew bald scientists.

Children's image of science

More than half of the children older than about six years drew backgrounds for their scientists. The most dominant feature, in three-quarters of the pictures, was the presence of chemical equipment, like flasks, beakers, tubes, and bubbling liquids, linked together in complex ways. Much of this is not usually found in the classrooms of such young children. The majority seem to see science as the processing of substances to make new materials. Add to these the 8 percent who saw science as an aspect of technology, and perhaps as many as eight out of ten seem to see science as inventing and solving practical problems. About 15 percent of the children drew living things in the background, mainly animals, a tendency noted in some studies from the United States where science was described as biology. Overall, the girls and boys responses were very similar, although slightly more girls drew chemical equipment than boys. On the other hand, boys drew scenes involving force, energy, Earth, and space more often than girls.

Scientist by a 6-year-old boy. Questioning revealed the scientist is balding and wears a special coat.





Scientist wearing a special coat and spectacles by a 6-year-old boy.

Science is more than a body of knowledge to be mastered. It is also a way of working and thinking. Almost all the children who drew backgrounds depicted indoor scenes. In most of these, the scientists were passive, looking out of the picture. However, there were 176 active scientists. Most of them were involved in some manipulative procedure, such as handling equipment, recording information or in some mental state, like puzzlement, euphoria, or enlightenment. Few children seemed to think science was something drawn entirely from books. There was no difference between boys and girls in this respect.

What the Draw-A-Scientist Test does not tell us

One limitation stems from children's drawing abilities which, of course, relate to their stage of development. Very young children often draw big, bald heads but mean nothing special by it. At the same time, some aspects of children's pictures are not always clear. This means that care has to be taken to check the meaning of pictures with the child before interpreting them. Here, in these pictures, trends like the tendency to draw laboratory coats were marked and obvious from about six years of age onwards.

There may also be differences between groups of children from different cultures and subcultures. The children in this study were predominantly white, reflecting the intake of the 80 schools in the sample.

There are also aspects of science and the scientist which the child may hold but be unable to express pictorially. For instance, hypothesising, planning a fair test and controlling variables, and drawing conclusions may at most be depicted as "thinking". This point was brought home to us when Matthew, a seven-year-old, added these words to his picture of a physician attending a patient:

> We all no wot scientist do thiy lk after us and thiy lk at the sun and the moon and the wold.
>
> [We all know what scientists do. They look after us and they look at the sun and the moon and the world.]

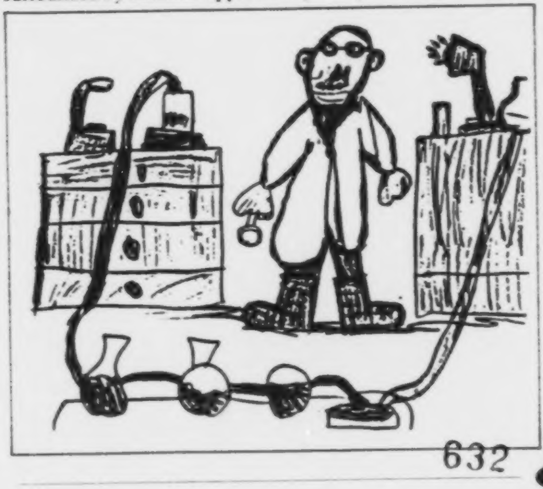
However, bearing in mind these limitations, it looks as though these boys and girls acquire some form of stereotypical image of a scientist as early as about six years of age. For them, the scientist is often male, bearded, wears spectacles and a white coat, and is balding. He spends most of his time indoors in his laboratory, inventing and making new materials. By six years of age, few children can have met many scientists. Such badges of the trade may reach them second-hand, through books and comics, and the television (including educational videotapes used in school).

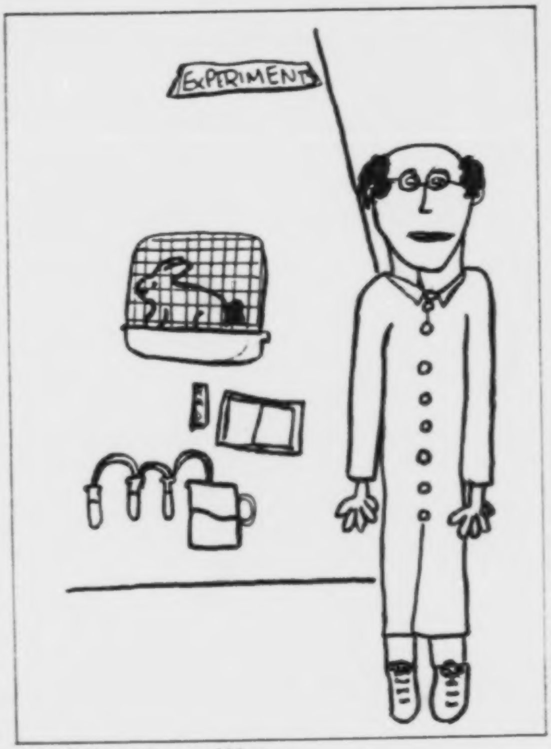
Men and women in science

In North America, Europe, Australia, and New Zealand more men than women follow science-based careers. The image of science and the scientist is often seen as one of the causes. With stereotypes like those described above, it is hardly surprising that girls may see science as less attractive than other careers. Attitudes and dispositions develop early and are strongly influenced by parents and family. Children may already be moulded for a particular niche before they attend school. For girls, that niche is often not science. In practice, the cause may be more complex. Some children may be more susceptible to stereotypical images by virtue of their mental makeup, however it is formed and shaped.

There have been several attempts to change the image of science and the scientist held by older children. In North America, practising women scientists and biographies of women scientists were introduced to students between 10 and 13 years of age. Also in North America, 10-year-old children had a chance to visit scientists' laboratories. These strategies were also tried in the U.K. with older pupils. The Jobs for Girls Roadshow has also attempted to show opportunities in science that are open to women. In general, such strategies have not had much effect.

Scientist with several of the stereotypical characteristics and surrounded by chemical apparatus by a 10-year-old girl.





Scientist by an 11-year-old boy.

One possibility is that women scientists, at present, may not be representative of girls likely to be influenced by stereotypes. Another is that they are not trained to communicate with young people in the way that teachers are. It is also likely that there are still more influences on children and adolescents than those experienced in schools. For example, stereotypes are often reinforced through children's literature and other media.

In the classroom

Faced with this, what can a teacher do? The first thing is to discover what his or her children think about science and the scientist. The Draw-A-Scientist Test is easy to apply and can give useful insights. Armed with these, the teacher is at least aware of the need to avoid strengthening stereotypes and may set about weakening them. If they do invite male and female scientists to talk to the children, it may help to make sure that they can communicate effectively and appropriately, verbally and non-verbally, with children. A woman scientist who cannot communicate may reinforce a stereotype just as much as a man may do. There may be pre-prepared video material which does the job better. For many children, the first and most important example of a scientist is often the teacher. It is important not to send the wrong signals in the way that they themselves interact with the children.

Some textual materials which children use can also reinforce stereotypes in obvious ways (like showing only male figures) but they may also do so in less obvious ways. For instance, examples and analogies may be limited to, say, sports which are still traditionally a male preserve. To maximise the chance of success it seems likely that teachers need to use appropriate strategies as early as they can - from the earliest years of schooling. Such actions may not solve the problem but they will at least not add to it and may even lend weight to developing social trends.

Notes

Dr Douglas Newton and Lynn Newton are both Senior Lecturers in Science Education in the Department of Education, University of Newcastle upon Tyne, St Thomas Street, Newcastle upon Tyne NE1 7RU, UK.

This ***set*** item is based on research described in:

Newton, D.P., & Newton, L.D. (1992). Young Children's Perceptions of Science and the Scientist. *International Journal of Science Education, 14* (3), 331-348.

We carried out this study to determine children's perceptions at the time of the introduction of science in the National Curriculum of England and Wales. Our intention is to replicate the study after the National Curriculum has worked through the primary phase of schooling (4+ to 11+ years) so that we might detect any effect it has had upon those perceptions.

Details about the Draw-A-Scientist Test carried out in Canada, the U.S., and Australia will be found in:

Chambers, D.W. (1983). Stereotypical Images of the Scientist: the Draw-A-Scientist Test. *Science Education, 60*, 371-387.

R.A. Schibeci and I. Sorenson's work in Australia is described in:

Schibeci, R.A., & Sorenson, I. (1983). Elementary school children's perceptions of scientists, *School Science and Mathematics, 83*, 14-20.

Some strategies which attempt to change older children's perceptions are described in:

Smith, W.S., & Erb, T.O. (1986). Effect of women science career models on early adolescents' attitudes toward scientists and women in science, *Journal of Research in Science Teaching, 23*, 667-676.

and in:

Kelly, A. (1987). *Science For Girls?* Milton Keynes, UK: Open University Press.

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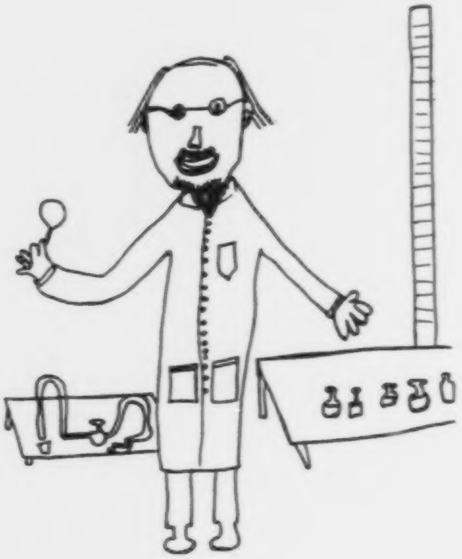

Scientist by an 11-year-old girl.

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set one, 1996

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14. **PLAY AS HEALING**
Dorothy G. Singer
Well directed play can help children overcome their fears and phobias. Two case studies from a leading American play therapist.

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note Ed

1996 heralds a year of change for **set**. We farewell Peter Jeffery, who has been the Australian editor since the first Australian issue — **set**: *Special Issue 1979*. With 31 **sets** and several *Best of* **sets** behind him, no wonder he's earnt the title *Mr* **set** *Australia*. Farewell also to John Gillespie, Art Editor since 1988. We wish them both well.

Welcome to John King, of the Australian Council for Educational Research, as the new assistant editor, based in Australia.

With improved literacy for all students high on schools' agendas, this issue of **set** includes an overview of the phonics versus whole language debate from renowned educationalist, Warwick Elley. Watch for replies in future issues.

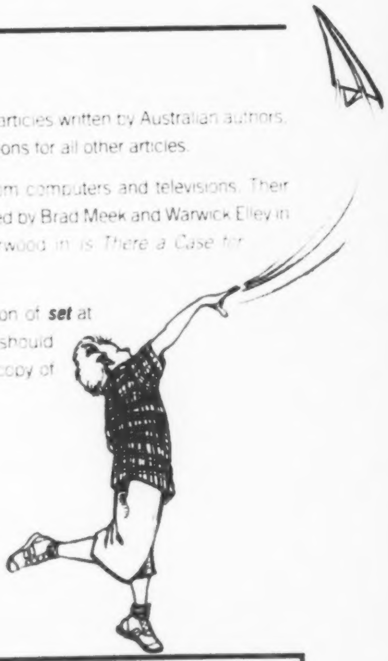
Spelling is always a thorny issue. Barbara Brann has developed a technique for analysing spelling "errors" which then enables teachers to tailor spelling instruction for each child. As a footnote, **set** follows Australian spelling conventions for articles written by Australian authors, and New Zealand spelling conventions for all other articles.

It's hard to keep children away from computers and televisions. Their usefulness for education is examined by Brad Meek and Warwick Elley in *The Magic Box*, and Jean Underwood in *Is There a Case for Integrated Learning Systems?*

We will be offering a bound version of **set** at the end of the year. Your school should now be able to keep at least one copy of **set** intact.

Happy reading.

Judith Wright
Editor



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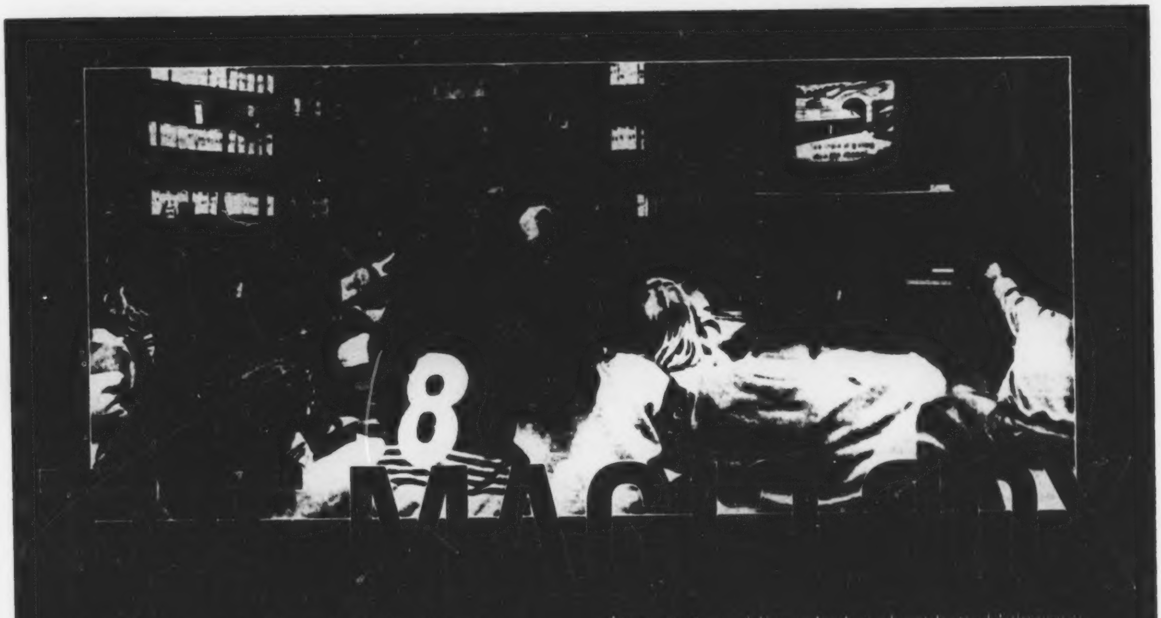

Brad Meek, *College of Education, Christchurch*
Warwick Elley, *University of Canterbury, Christchurch (Retired)*

An evaluation of the potential of captioned television as an aid to reading instruction.

THE ENEMY OF READING?

Many educators see television as an enemy of the reading habit. Children who glue themselves to the box are rarely competent readers. There just isn't time to be hooked on books and hooked on television at the same time. In 1990 New Zealand participated in an international survey of literacy levels in 32 countries conducted by the International Association of the Evaluation of Educational Achievement (IEA). One of the issues addressed in this survey was the influence of television viewing on reading ability. In this area the survey's findings largely confirmed the predicted trend stated above. It also established the fact that New Zealand children were second only to those in the United States in the amount of time they spent watching television. Cause for some concern perhaps?

However, the picture may not be as black as we feared. A few research findings suggest that television could indeed have some redeeming features from the reading specialist's point of view. The first was an unexpected finding from the IEA survey. In five of the developed countries surveyed the best readers were watching moderately high levels of television (three to four hours per day). Clearly this is in conflict with the popular view of the impact of television on literacy levels. How could this have occurred?

ADVANTAGES OF WORDS WITH PICTURES

It seems that in Scandinavia, for instance, children watch many imported foreign films which have subtitles in their own language. This gives them abundant practice at reading rapidly, under stimulating conditions, where they genuinely want to understand, and where they have the cues from the picture and the foreign language to ensure that their input is "comprehensible". Television can help reading in such circumstances.

These findings have been strengthened by recent studies of captioned television in the United States. Grade 7-8 bilingual students (12-13 year-olds) who watched science videos with captions in English, over a period of 12 weeks, acquired more science vocabulary and were better able to retell what they saw than those who saw the videos without subtitles, or who studied the material in other ways. The authors interpreted the benefits in terms of greater "comprehensible input" from pictures and words together.

A TELEVISED RAY OF SUNSHINE

If television can be helpful for improving reading can it also be used to teach younger children to learn to read in the first place?

In 1993, an enterprising New Zealand book publisher set out to use television to assist five-year-olds in learning to read. Wendy Pye Ltd (Auckland) produced a set of 52 twenty-five minute videos entitled *The Magic Box*. This series was shown on New Zealand television in 1993. It has also been shown on television networks in the United States, and is sold on video cassettes in Asia and elsewhere.

The videos sought to teach early reading and language skills by presenting short stories from a series of *Sunshine* books for beginning readers, with caption support as well as verbal support from a narrator.

The aim of this article is to describe and evaluate the success of this programme in teaching typical five-year-olds to read in a school setting.

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WHAT IS THE MAGIC BOX?

The Magic Box consists of 52 televised episodes of 25 minutes each, grouped into sets of five (the fifth episode is a review episode of the previous four). Each episode sets out to teach children to read three short stories contained within one book from the *Sunshine Extension* series. In addition a traditional story is told, with pictures; and children are given some lively and enjoyable instruction in the letters and sounds of the alphabet, always in the context of the story. The underlying assumption is that children who are hooked on stories will teach themselves the basic skills. Thus phonics are taught, but always in context. To retain the children's attention there is a fast-paced mix of songs, raps, games and stories.

The programme makes good use of the advantages of television, using such devices as page turning, highlighting of letters and words, linking sounds, words and pictures, pauses for prediction, and building up background knowledge in preparation for reading. The books taught are graded in difficulty from one word captions in the first episode to three or four lines of text per page in later episodes. Vocabulary and structures are learned incidentally using predictable patterns and repetition. Each story is introduced before being read at least twice in a "shared reading" format, with ample opportunity for interaction by the children. The stories range over many universal themes of interest to children — such as family, animals, food, weather, space, clothes, toys. The books cover the emergent and early reading stages, and are sequenced in the same order as the *Sunshine Extension* book series. This is seen as an important ingredient of the total package.

The series proved popular with many teachers and parents when it was broadcast in 1993, although the time it was presented was not ideal for schools. Most children appear to enjoy it, and concentration levels are consistently high according to our observation sessions with five-year-olds in schools.

EVALUATION OF THE PILOT STUDIES

In 1994 we conducted two pilot studies, in two Christchurch schools, to assess the impact of *The Magic Box* on new entrant classes (five-year-olds). In the first study, we showed the first 10 episodes, once, without any associated book support, to a group of 21 new entrant children over a period of two weeks. After gaining permission from parents/caregivers we tested the children individually, before and after the video series, on their knowledge of the alphabet, sight words, and accuracy in reading an unfamiliar story (after modelling by the researcher). We systematically observed the children's concentration during the video presentations and were impressed. They rarely looked away. "On task" behaviour was consistently well over 90 percent.

The tests showed that the children had made definite gains both in sight words and on the running records, but very little change in alphabet knowledge. We hypothesised that there would be greater gains if the children read the associated book after each video.

In the second pilot study, in another school, we showed 16 new entrant children the first eight episodes (twice on successive days), omitting the revision videos. This time we arranged for the children to read the associated books in pairs for five minutes after each presentation. One member of each pair took the book home to read to parents/caregivers after the first showing; the other did the same after the second showing.

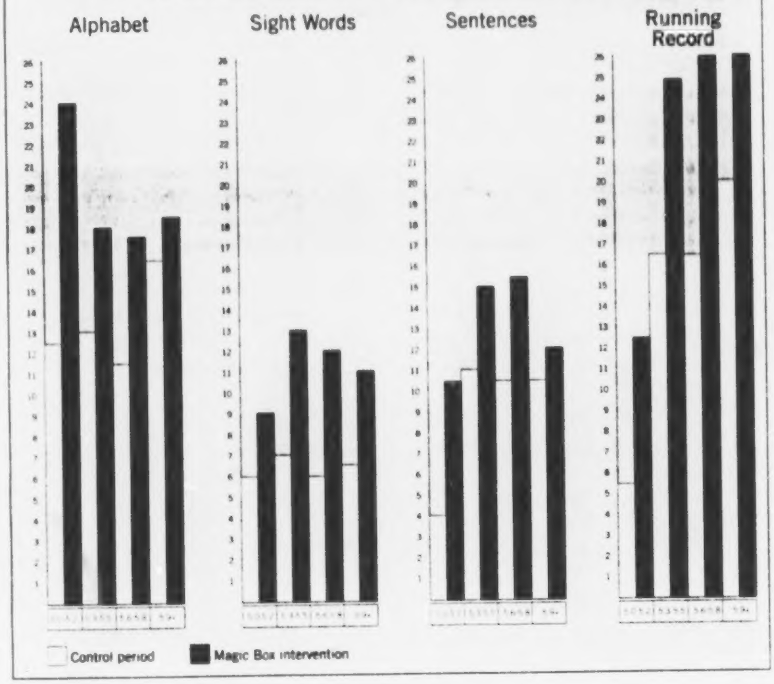
Once again, the children observed the videos with high levels of concentration, and joined in spontaneously when the video presenter encouraged them to do so. Surprisingly, they were even more absorbed in the second showing than the first.

As before, we tested the children before and after showing the videos on a range of reading skills. This time, the children's growth was much stronger in all tests. For instance, they improved by 13 percent on alphabet knowledge, by 21 percent on basic sight words and by 40 percent on their ability to read a short story aloud without assistance. The average gain over eight reading tests was 24.8 percent which represented an average gain of 1.79 standard deviation units. These were regarded as very promising gains, given that they were achieved over a period of only four weeks. Apparently, the repeat viewings combined with the addition of the buddy-reading immediately after the showing of the videos had a consolidating effect. It seemed unlikely that the books by themselves could have had such an impact, as paired reading with high interest books is a common practice and the first study had shown an average gain of only 6 percent when the videos were shown without books. We proposed that it was the combination of *The Magic Box* videos and the associated books that was worth further study.

EVALUATION OF THE MAIN STUDY

In the first two terms of 1995 we made a longer and more systematic evaluation of *The Magic Box* programme. We wished to investigate whether the video series as a whole, with its associated *Sunshine* books, could make a real impact on the reading growth of typical five-year-olds in a range of schools. To find out, we obtained the co-operation of five Christchurch primary

FIGURE 1 MEAN GAINS IN READING SUBTESTS CLASSIFIED BY AGE



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schools. After consulting with teachers and parents, all schools agreed to show the videos over 10 weeks to their New Entrant (five-year-olds) or J1 classes (five-and-a-half-year-olds) during the second term of 1995. The New Entrant children were to focus on the first 20 episodes (plus books) in the series, while J1 children viewed 20 consecutive episodes (plus books) from further through the series, depending on the average level of reading development of the class (as indicated by pretests). In this way, we were able to assess the impact of most of the video series throughout one term at school.

During the first term of 1995 we first measured the normal amount of children's growth in reading produced by the five teachers over ten weeks. During the second term we measured the growth in reading of the same teachers' children as they experienced *The Magic Box*. In many cases these children were the same ones in both terms; in a few cases new pupils had arrived, and others had moved up a class. However all comparisons between intervention and control group children were made on children of the same age. It is also important to note that the additional time involved in showing the videos and providing for the buddy-reading was gained by omitting some part of the reading/language programme. As a result no additional time was allocated to reading or language activities during the second term.

More precisely the design of the study was as follows:

1. We tested 92 children in five classes on six aspects of reading in February and again in May, to determine how much they normally develop in reading during one term. Each child was interviewed separately, for 15-20 minutes. All testing was done by the two researchers, and one trained assistant (a teacher). Two of the tests had alternate forms, and these were rotated for successive tests: that is, children who took Form A in February had Form B in May.
2. The tests given were:
    a. Knowledge of letters and sounds of the alphabet (52 letters).
    b. A list of 50 graded sight words (to, is, the ... helicopter, chocolate) (50 words).
    c. Short sentence reading with pictorial cues (40 words).
    d. Accuracy score on unseen story, graded in difficulty, from magenta level to green level (9 levels).

    Two additional sets of 10 multi-choice items were given to test for word recognition and initial sounds but proved too short to be reliable, and were subsequently dropped.
3. The five teachers showed the videos in 20 episodes to their pupils, in 10 weeks, at a rate of two per week. Each episode was shown twice on successive days, during the normal reading periods. (Fridays were set aside as catch up days if required.) No extra time was given to reading during the project.
4. The children then spent five minutes reading aloud, in pairs, the stories from the books shown in the video for the day. One member of each pair took the book home to read on the first day; the other child did the same on the second day.
5. At the end of the second term all pupils were retested on the same tests of reading, under the same conditions as before.

RESULTS

The results were analysed by comparing the gains made by the pupils who took *The Magic Box* programme in term 2 with pupils of the same age, in the same classes, who did not take the programme in term 1. The pupils were grouped, by age, into four groups. (5 years 0 months-5 years 2 months; 5 years 3 months-5 years 5 months; 5 years 6 months-5 years 8 months; 5 years 9 months+). As the tests were administered 11-12 weeks apart, only those pupils who were older than 5 years 8 months in February 1995 were in the same age group for both comparisons. All the others had moved up into the next age group by May.

The actual sample size changed slightly from term 1 to term 2. In February 92 pupils were tested across the five classes. In May, six of these pupils were absent or had been promoted. However, another 22 pupils had arrived, increasing the sample size to 108. By the final testing in August, another 10 pupils had moved on, and two more were excluded because they had been accepted for Reading Recovery. In addition, one teacher had misunderstood the directions, showing less than half of each video during the allotted period in the second term. This teacher's group of 19 pupils were therefore analysed separately.

A further complication was that some pupils had already mastered the content of some of the tests by February, and consequently were close to the "ceiling" of those tests at the outset. In the alphabet test, the sample size was reduced by 39 for this reason. Clearly pupils could not demonstrate improvement in alphabet knowledge if their scores were at or near the maximum in the pretest. For the other tests, the numbers who approached the ceiling were much less: 7, 15, and 8 respectively for sight words, sentences, and

TABLE 1 **RAW SCORE MEANS ON FOUR TESTS FOR VIDEO GROUPS AND CONTROL GROUPS, CLASSIFIED BY AGE**

AGE		*ALPHABET*		*SIGHT WORDS*		*SENTENCES*		*STORY READING*	
		Video	*Control*	*Video*	*Control*	*Video*	*Control*	*Video*	*Control*
5.0-5.2	Pre	11.20	12.25	0.82	0.17	0.18	0.75	0.00	0.08
	Post	35.00	24.83	9.73	6.17	10.64	4.58	1.45	0.83
5.3-5.5	Pre	25.00	17.80	7.69	5.65	7.67	3.42	1.31	0.35
	Post	42.75	31.27	20.44	12.70	22.60	14.14	3.81	2.22
5.6-5.8	Pre	19.67	21.05	13.26	8.42	11.75	6.35	1.59	0.92
	Post	37.00	32.50	25.21	14.54	27.50	17.04	4.18	2.75
Over 5.8	Pre	23.09	26.78	16.91	16.73	14.18	14.10	2.00	2.75
	Post	41.55	43.11	27.50	23.07	26.45	24.60	4.58	4.94

TABLE 2 **MEAN RAW SCORE GAINS ON FOUR TESTS FOR VIDEO GROUPS AND CONTROL GROUPS, CLASSIFIED BY AGE**

AGE	*ALPHABET*		*SIGHT WORDS*		*SENTENCES*		*STORY READING*	
	Video	*Control*	*Video*	*Control*	*Video*	*Control*	*Video*	*Control*
5.0-5.2	24.20	12.58	8.91	6.00	10.45	3.83	1.25	0.75
5.3-5.5	17.75	13.46	12.75	7.04	14.93	10.71	2.50	1.87
5.6-5.8	17.33	11.45	11.94	6.11	15.75	10.69	2.59	1.83
Over 5.8	18.45	16.33	10.59	6.33	12.27	10.50	2.58	2.19

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story reading. Pupils were dropped only from the tests in which their pretest score approached the ceiling. Thus, for most tests, 70-80 pupils were compared, broken down into the four age groups.

The average amount of gain shown by pupils in each of the four age groups, for each test is given in Table 1. The mean gains in *The Magic Box* video intervention are given first, for each test.

Table 1 shows the pretest means and post-test for each of the four age groups for both the video intervention groups and the control groups. Table 2 shows the mean gains obtained by the same groups between pretest and post-test.

Table 2 shows that on every one of the 16 comparisons pupils who were exposed to *The Magic Box* made substantially greater gains than comparable pupils who did not see the videos. In percentage terms, the gains were very large. Thus, for the first comparison, the youngest group (5 years 0 months-5 years 2 months) improved in their knowledge of the alphabet by 24.2 letters and sounds (out of 52 tested). The normal expected gain for this age group is 12.6 letters and sounds. This represents an improvement for *The Magic Box* group of 92.4 percent, nearly twice the rate of growth and clearly significant.

The average improvement across all tests for the four separate age groups (from younger to older) was 95.1 percent, 46.5 percent, 58.9 percent and 28.8 percent (see Table 3). As can be seen the benefits were greatest for the younger children, for whom the series was originally developed. However inspection of individual scores shows that there were very few children in any age group who did not show healthy progress as a result of the video programme. Indeed the children with lowest pretest scores made by far the greatest gains. A comparison across tests shows that improvement was greatest in the sight words, followed by sentence reading.

The benefit produced by *The Magic Box* can be summarised most simply by calculating the average gain across all pupils and all tests. On average children learned 57.3 percent more during *The Magic Box* intervention when compared against the control period.

TABLE 3 MEAN IMPROVEMENT FOR VIDEO GROUP, EXPRESSED AS PERCENTAGE GAIN OVER CONTROL GROUP GAINS

AGE	*ALPHABET*	*SIGHT WORDS*	*SENTENCES*	*STORY READING*	*MEAN IMPROVEMENT*
5.0-5.2	92.4	48.5	172.8	66.6	95.1%
5.3-5.5	31.9	81.1	39.4	33.7	46.5%
5.6-5.8	51.4	95.4	47.3	41.5	58.9%
Over 5.8	13.0	67.3	16.9	17.8	28.8%
MEAN IMPROVEMENT	47.2%	73.1%	69.1%	39.9%	57.3%

TABLE 4 MEAN GAINS IN RAW SCORE BY GENDER

	ALPHABET		*SIGHT WORDS*		*SENTENCES*		*STORY READING*	
	Video	*Control*	*Video*	*Control*	*Video*	*Control*	*Video*	*Control*
MEAN GAIN BOYS	17.3	13.8	8.4	5.6	10.5	7.8	1.97	1.33
MEAN GAIN GIRLS	21.3	12.7	13.5	7.3	14.8	11.3	2.74	1.99
DIFFERENCE AS A PERCENTAGE	23.1%	-8.0%	60.7%	30.4%	41.0 %	44.9%	39.1%	49.6%

Figure 1 presents the main findings in pictorial form. For each age group, mean progress in the first term is given on the left of each pair, while mean progress for the second term, during the video intervention, is given on the right (in black). The level scores for the Story Reading Running Record have been multiplied by 10 to enable them to be included on the same graph as the other tests.

Birthday Party
At the Zoo
Watching TV
Where Is My Dad?
The Sausage
My Bike Can Fly!
The Dragon
A Journey
I Can Climb

Further analysis shows that the girls made greater gains on seven of eight comparisons (see Table 4), while a breakdown by schools shows that similar progress was made in each school. The one class which was shown less than half of the video series made more gains than the control group, but less than the other intervention groups, as one would expect.

CONCLUSION

Can children learn to read with the aid of *The Magic Box*? Our data show that when the video series is used with five-year-olds, and the children read the supporting *Sunshine Extension* books, they made rapid gains in relation to their normal rate of progress in reading. Furthermore, they enjoyed the programmes, joined in willingly, and concentrated consistently well. Television may well have a key role to play in teaching children to read. *The Magic Box* is a local product, with a characteristically kiwi philosophy about the teaching of reading. It clearly warrants wider coverage.

NOTES

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WARWICK ELLEY is Emeritus Professor of Education, recently retired from the University of Canterbury. In 1991 he received the IRA's International Award for his research on literacy. He is currently working in Third World countries to raise literacy levels in primary schools.

The international survey of literacy levels which reported the benefits of sub-titles in foreign films is found in:

Elley, W.B. (1992). *How in the world do students read?* Hamburg, Germany: IEA.

That "comprehensible input" is a crucial feature in efficient language learning is explained in:

Krashen, S. (1982). *Principles and practice in second language acquisition.* Prentice Hall.

Further studies of the advantages of captioned television can be found in:

Neuman, S.B. & Koskinen, P. (1992). Captioned television as comprehensible input: Effects of incidental word learning from context. *Reading Research Quarterly, 27*(1), 94-106.

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VIOLENCE IN SCHOOLS principals' perspectives

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Overall there is little reliable data available regarding the level of violence in Australian schools, although there is a perception by teachers that they are having to deal with increases in violence both in quality and degree. A 1993 survey of 43 schools by the Victorian Association of State Secondary principals found that 16 schools reported violent incidents towards staff. The effect of potential violence on the capacity of teachers to teach is easy to imagine but difficult to quantify. Trespasser violence was seen to be an increasing problem.

The Role and Accountability Statement for Principals in Government Schools in Victoria states that the principal must plan, implement, and monitor arrangements to ensure the safety, security, and general well being of all students in attendance at the school. The most frequently stated right in school charters under the Schools of the Future program in Victoria has been the right to safety. Schools have an obvious desire to project the image to parents that they are institutions where students are both safe and secure.

During Term I of 1992 the Victorian government school of which I was the vice principal was involved in a vicious inter-school brawl with a neighbouring Catholic boys college. The venue for the brawl was the forecourt of the local railway station, situated between the two schools. Our school was besieged by the media for approximately two weeks and rumour of further inter-school problems continued for two terms.

One month after the first incident a senior class at our school was "invaded" by five students from another neighbouring government school. Under the pretext of being new students they threatened a very experienced teacher. During Term II of that year, the vice principal of a neighbouring government school was severely assaulted by a group of students from another school in the grounds of his school. Further, several weeks later, the staff of a neighbouring primary school were besieged by a drug-crazed youth as they awaited a parents meeting that evening.

These incidents were all very unusual, destabilising for the schools involved, and the source of multiple community rumours. It was in this climate that I initiated discussions with staff at Latrobe University to undertake a research project that would ascertain whether other schools had experienced significant problems of violence and what proactive and reactive measures schools had implemented. I was of the opinion that if I could document programs and make conclusions, then perhaps I could produce material that would be of practical use to principals.

SOCIO-ECONOMIC CONTEXT

The research was undertaken in the northern wedge of the greater Metropolitan Melbourne. Traditionally employment in this area was centred around the textiles, footwear, clothing, and automative industries. Structural economic changes and recession caused massive adult and youth unemployment which rates amongst the highest in Australia, particularly long term unemployment. The region has one of the lowest rates of participation in tertiary education and income tax returns indicate significant poverty.

CONSTRUCTION OF THE RESEARCH

After a considerable period of background reading it become clear that little research had been undertaken on this topic in Australia. I trialled questionnaires and developed one which could ascertain the perspective of principals, vice principals, and site principals. For the purposes of the questionnaire I defined violence in a school setting as being where any members of the school community (student, staff, parent, or visitor) is assaulted, intimidated, or abused. For the purpose of this article "principal" refers to principals, vice principals and site principals.

The questionnaire estimated the relative and absolute significance of violence for principals for their schools. It measured the frequency and significance for principals of 19 possible forms of school violence. Principals were then asked to consider why various forms of violence are significant for their school, whether there is a pattern of occurrence and what proactive and reactive programs/steps have been undertaken and the relative success of such programs/steps.

The second section of the questionnaire examined possible causes of violence in schools and solutions that schools have attempted to implement. (See **Notes**.)

The final section measured changes to the level or nature of school violence as it affects nine aspects of school operations and planning.

The questionnaire was administered in person. I interviewed principals in 33 secondary schools, 31 being government schools, one Catholic school and an Anglican school from outside the Northern region. Two of the schools are girls schools and the remainder are co-educational schools. The schools had a total of 21,975 students as at February 1994.

PRELIMINARY RESULTS OF RESEARCH

When principals rated the time and resources that schools invest in setting up and maintaining procedures to prevent and respond to violence, compared to all other issues, on 1-10 scale, the mean result of the 33 surveyed schools was 3.8, with a range of 1-8. In addition to this relative measurement, principals were asked to rate in absolute terms how significant an issue violence is for their school. On a scale of extremely significant (5) to insignificant (1), the mean score was 3.5, which indicates that the mean is between significant and very significant.

This would appear to indicate that although school violence is perceived as a significant issue, it does not devour relatively large amounts of time and energy. This is probably because unlike issues such as the huge task of a school implementing the Schools of the Future program and curriculum development, school violence is a non-continuing issue with peaks, sometimes severe, and large troughs.

This suggestion is perhaps confirmed by the principals' response to the question of whether there had been any time during the past 12 months when they would have considered school violence as being one of the most important aspects of their operation. Twenty-four of the 33 principals considered that violence had been a dominating issue for them. The period of time involved was usually one to two weeks, although for some schools the problem had continued for up to one term.

EXAMPLES OF WHEN VIOLENCE IS A DOMINANT ISSUE

- Violence initiated by outside people.
  - Severe assault by outsiders on vice principal.
  - As a result of a "gate crashed" party and fight during the weekend, the disturbance overflowed into the school for the following week, with outsiders invading the school and weapons being involved.
  - Staff demoralised by the physical assaults on two co-ordinators by an outside person. The staff suspected that these were "paybacks" because of discipline action Year Level Co-ordinators had taken. Threatening notes to staff were left under doors and on staff car windscreens.
  - Continual harassment of school by outsiders during recess and lunch times (three schools).
  - Invasion of school by ethnic gangs believed to be organised in suburbs well distant from the schools (three schools).
- Violence initiated by ex-students.
  - Group of ex-students, who had been "advised to leave", returned to the school to vent their frustrations as a result of them considering that they had been unfairly treated.
  - Ex-student continually harassed school and eventually drove a car at the principal with the intention of causing severe injury.
  - Ex-students with criminal records, who suspected that current students gave information to the police, tried to intimidate the students by continually trespassing and hiding in school toilets.
- Violence initiated by current students.
  - School had to cope with extremely violent young people who had enrolled at the school from a nearby Health and Community Services medium term housing unit.
  - New school, before it had developed and implemented a Code of Student Conduct, had severe problems with student violence.
  - Damage to school in excess of $10,000 caused at night by rampaging year 12 students.
  - Outbreak of physical assaults by students on other students over several days (three schools).
  - Multi-campus school which rationalised campuses into years 7-10 and 11-12 campuses, and also received many students from a nearby closed school, experienced continual student fights and assaults.
- Violence initiated by students from other schools.
  - Continued assaults upon students at local railway station by students from another school.
  - Milling of several hundred students from two schools, reacting to a rumour. Students dissipated because of the arrival of police cars and helicopters.

In summary, it appears that many of the examples of violence that principals have identified as being those specific times where violence has been one of the most important aspects of their operation, are incidents that involve outside people, ex-students and students from other schools. In these situations the principal has no direct jurisdiction over such people and these people are not responsible to the school community. It would also appear that it is extremely difficult to predict such situations and therefore difficult for school administrators to be proactive in preventing such incidents.

FREQUENCY AND SIGNIFICANCE OF 19 FORMS OF SCHOOL VIOLENCE

As indicated earlier, those issues as above, although significant for principals, may not occur very frequently. To investigate this issue, principals were asked to assess the frequency and significance for their school of 19 forms of violence that may occur in their school. See Table 1 for the mean scores (where 4 is the maximum score and 1 is the minimum score) and ranking of 19 forms of violence.

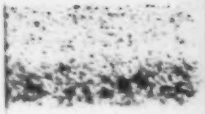
It would appear that for this group of schools the more frequent forms of violence, occurring approximately once per term or more, include: student assaults, the presence of, and verbal abuse by, trespassers, and sexual harassment between students. The forms of violence which are very rare include: assaults on teachers by outsiders, students and family members, students from different schools assaulting each other, groups of students assaulting one student and sexual harassment of staff by students. Those forms that principals consider to be more than significant include: outside people assaulting students, verbally abusing staff, loitering outside the school and trespassing. Violence which is significant for the schools includes: verbal abuse of teachers, student/student assaults, sexual harassment, and students possessing weapons.

Further analysis of the principals' responses showed that the forms of violence which principals consider to be the most significant for their schools are not necessarily those with the highest frequency, that is, those forms relating to the intrusion into schools by outside

TABLE 1: **MEAN SCORE AND RANKING OF THE FREQUENCY**

Item	Form of violence	Mean Score		Ranking	
		Frequency	Significance	Frequency	Significance
1	Student verbally abusing teacher	3.6	3.4	1	2
2	Trespassers being on school premises	3.4	3.1	2	12
3	One student physically assaulting another	3.2	3.1	3	11
4	Two students physically assaulting each other	3.1	3.3	4	7
5	Outside people verbally abusing staff when challenged	3.0	3.4	5	4
6	Sexual harassment between students	3.0	3.2	6	9
7	Students possessing weapons at school	2.6	3.4	7	5
8	A potentially dangerous group/individual loitering outside school	2.4	3.3	8	6
9	Parents/family members verbally abusing staff	2.4	3.2	9	8
10	Your students assaulting each other outside of school	2.3	2.8	10	18
11	Outsiders assaulting students because of non-school conflict inside the school	2.2	3.4	11	3

The calculation of the correlation co-efficient for the mean score of frequency and significance is 0.608. This indicates that a correlation between the fac



people. Student abuse of teachers has a very high ranking for both frequency and significance. This is probably because of the stress it causes teachers and the administrative time that it devours. Although trespassers being present is very frequent, it does not possess a particularly high ranking for significance, perhaps because administrators are proficient at dealing with the problem. Although student assault occurs frequently, it is not a priority problem in significance because most schools have well established and known practices in coping with this problem. On the other hand, although weapon possession is not a frequent occurrence, its potential for disaster is apparent in the high ranking that principals give to its significance.

SUGGESTIONS FOR SCHOOLS

This research also shows that the schools with strong leadership, where there is a recognition by staff that violent behaviour can be changed, where a whole-school approach to violence is developed, and where emphasis is placed on student responsibilities to themselves and others, have a good chance of solving the problem of violence.

Bullying is receiving attention in schools. Australian research has now consistently found an incidence of one in seven Australian school children being involved in bullying to the extent that it impairs their performance. Bullying appears to peak in the early secondary years, when physical differences between students due to variability in the onset of puberty are most apparent. There are many programs available on this topic.

The successful solutions suggested by the principals in the researched group of schools can be divided into the following types of solutions.

PENALTY SOLUTIONS

- Make sure there are specific, known penalties for violence which are clearly set out and fully understood.
- Use student contracts/behaviour cards for violent students.
- Make sure students understand that anyone causing the name of the school to be disgraced will suffer severe penalties – covers all contingencies.
- Deliberately allow rumours of penalties to flourish.
- Use "time out" rooms/suspension/detention.

FAMILY INVOLVEMENT SOLUTIONS

- Make the parents responsible for student behaviour, particularly the use of a strong (influential and well respected) family member. Make the expectations clear upon enrolment.
- Encourage and support families in the laying of criminal charges for assault against students – make this a known school policy.
- Implement access to effective parenting courses operated by outside agencies. The challenge is to encourage the parents for whom the program is most relevant to participate.
- Use religious leaders to work with families to enforce school policies.

SCHOOL STRUCTURE SOLUTIONS

- Divide the school into the smallest units possible.
- Implement a student management structure whereby Year Level Co-ordinators and Student Welfare Co-ordinators have high status and the maximum affordable time allowance.
- Have co-ordinators and Pastoral Care Teachers follow students throughout their years at the school.
- Reduce student movement throughout the school by using multi-purpose classrooms as much as possible.
- Implement a program of lunchtime activities and invest in sporting equipment and facilities that students can and will use at lunchtimes.
- Involve the Student Representative Council.
- Shorten lunch and recess times, if and when necessary.

CURRICULUM SOLUTIONS

- Develop a curriculum which emphasises human relations, conflict management, self-esteem and anger management.
- Encourage peer support programs.
- Develop a school culture whereby the expectation is that student bystanders will prevent/stop violent acts.
- Encourage programs and activities which will bond teachers and students together.
- Allow outside community agencies to implement proactive programs in the school.
- Offer anger management programs.
- Use outside foundations to provide finance for youth workers to work with students at risk. The aim is to prevent homelessness by supporting the family and student.
- Offer study and organisation skill programs which might help some students cope and gain success.
- Initiate intensive group and whole-year counselling programs.
- Use the police for group discussion on the realities of violence.
- Involve speakers from different ethnic cultures to explain their attitudes, values, beliefs and principles, to the staff and students.

OTHER SOLUTIONS

- Keep a constant network operating of "what's on".
- Offer a less formal timetable for Mondays, which are often bad days for students from broken homes.
- Make sure senior staff are visibly present in the yard on Fridays, when everyone is tired and teachers are "grumpy".

AND SIGNIFICANCE OF 19 FORMS OF SCHOOL VIOLENCE

	Form of Violence	Mean Score		Ranking	
		Frequency	Significance	Frequency	Significance
12	Outsiders assaulting students inside the school because of a school related conflict	2.2	3.6	12	1
13	Sexual harassment of staff by students	2.1	3.1	13	10
14	Your students and students from another school assaulting each other outside both schools	1.8	3.0	14	13
15	A group of students assaulting another student	1.7	2.9	15	14
16	Your students assaulting students from another school inside the other school	1.5	2.8	16	17
17	Outsiders assaulting staff	1.4	2.8	17	15
18	Student assaulting teacher	1.4	2.8	18	16
19	Parents/family members assaulting staff	1.2	2.2	19	19

[illegible]

- Ensure extra yard duty by senior staff on very windy or hot days.
- Make sure administrators are in corridors at the start of classes to solve the problem of teacher lateness, which can lead to violence between students.

SOLUTIONS TO OUTSIDE PEOPLE INITIATING VIOLENCE

PROACTIVE SOLUTIONS

- Develop a school Safety Committee to review security, and a "Displan" program to operate when the school is "under threat" (includes students inside, staff outside).
- Have a plan whereby staff, *as a group*, confronts any potentially dangerous group of outsiders.
- Develop a school culture whereby students inform staff of the presence of outsiders. This should be part of student citizenship.
- Develop a personal and effective relationship with senior local police.

REACTIVE SOLUTIONS

- Use car registration number and ring the emergency police number, not the local police.
- Dramatic arrest incident staged by school and police. (For instance, one school worked with police to arrange a scenario, as the school was being dismissed and therefore large numbers of students were leaving, whereby the police arrived with sirens blazing and lights flashing to bundle a youth who had been "stalking" the school into a police car.)
- Use undercover police.
- Consider asking police to visit the homes of ex-students who are causing problems. This can decrease outsider problems.
- If a violent incident has attracted adverse media attention, hire a professional journalist to provide a media release.
- Take a video camera outside when intruders are present — it doesn't have to work.
- Provide mobile phone/UHF radios for staff on yard duty to alert staffroom and administrators of problems.
- Use whole-school assemblies to turn around violent incidents. Harness the energy and shock the perpetrators into constructive roles.
- Consider installing a high fence around the school with the only access gate kept locked after school hours.
- One female principal thought that outsiders were usually surprised when confronted by a woman and were less likely to be aggressive to a woman because she is not challenging their "manhood".
- If the schools' own students cause problems at another school, insist they apologise at the other school then proceed with normal discipline procedures.

NOTES

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This research was carried out as part of a Masters Degree in Education, and has been reported in:

Mc Craith, C. (1994). *Violence in schools: Principals perspective.* Paper presented to the Annual Conference of the Australian Association for Research in Education, University of Newcastle.

The possible causes of violence included in the questionnaire were:

- Sub-culture of the local community/family is such that violence is a normal method of response.
- Depressed economic conditions lead to frustration and violence within the family and these overflow into the school.
- Students have the talent and energy to assume adult roles, but because of changes to the structure of employment, cannot become independent of parents and become frustrated, angry and violent.
- Lack of jobs for senior students who want to be at work not school, causes them to become frustrated, angry and violent.
- Students realise that because of their background they may not be able to achieve rewarding careers and are consequently frustrated.
- Students have emotional disorders/defective personalities.
- Students perceive themselves as failures and trouble-makers and act accordingly.
- Decreases in staffing and community service supports.
- Teachers using inappropriate teaching styles that lead to frustration and anger.
- Violence in the media and copy-cat behaviour leads to a general acceptance of violent behaviour.
- Violence is a way for boys to demonstrate their masculinity.
- Teachers causing an escalation of a minor incident into a violent incident, because of their lack of perception and skills in student management.
- Families are collapsing and students feel angry.
- Continual, but unreported, teasing builds up and explodes into violence.
- Students have little bonding to the school, little commitment or attachment, and few aspirations.
- Students view teachers as having no real power.
- Incompetent teachers fail to take action when appropriate and such lack of action leads to the escalation of an incident.
- Lack of participation in sport and other physical outlets.
- Basic racism.
- Basic sexism.
- Students coming into the school from a closed school/campus feel disenchanted and angry.
- Parents have lost control of their daughters and sons.
- Teachers who are stressed, and with low morale overreact to a minor incident, which leads to a violent incident.
- Students are bored and are seeking excitement and thrills.
- Insensitive teachers who bait and tease students and cause violent student reactions.
- Because of staff reductions, school organisational structure becomes more inflexible, causing students to become frustrated and angry.
- Staffing reductions prevent the school from providing the necessary pastoral care and counseling that may prevent violence within the school.
- Lack of sufficient and appropriate resources for integration students, who have a disposition towards violent behaviour.
- Administrators lack appropriate powers to exclude violent students on a permanent basis.

The House of Representatives Report on violence is:

House of Representatives Standing Committee on Employment, Education and Training (1994). *Sticks and stones: Report of violence in Australian schools.* Australian Government Publishing Service.

That the principal must plan, implement and monitor arrangements to ensure the safety of students is from:

D.S.E. (December, 1993). *Principal selection guidelines.* Victoria.

The 1993 survey of violence in schools is:

Ollis, D. & Tomaszewski, I. (1993). *Gender and Violence Project.* Melbourne: Department of Education, Employment and Training.

Slee, P.T. & Rigby, K. (1993). *Australian school children's self appraisal of interpersonal relations: The bullying experience.*

That the right to safety is the most frequently quoted right is from:

D.S.E. Victoria, (1994). *Schools of the future: Guidelines for developing a school charter.*

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set one, 1996

GOALS AND SCHOOL MOTIVATION:

Aboriginal and Navajo Perspectives

Dennis M. McInerney and Valentina McInerney, University of Western Sydney, Macarthur

Research at the classroom and school level suggests that students perceive that schools and classrooms emphasise particular types of goals. The goal theory of achievement motivation argues that the goals stressed by schools have dramatic consequences for whether children develop a strong sense of self-efficacy and a willingness to try hard and take on challenges at school, or whether they avoid challenging tasks, giving up when faced with failure. It is commonly believed that indigenous minority children such as Australian Aboriginal children and Navajo Indian children are poorly motivated at school because schools and classrooms stress goals that are incompatible with their cultural values. In the following article we discuss the relevance of a range of goals to Aboriginal and Navajo children and their relationship to school motivation and achievement.

Competition Comparison Competition Comparison
Competition Comparison Competition Comparison
BELSHAW

Goals refer to the different purposes that students may have in various achievement situations, and are presumed to guide students' behaviour, cognition, and motivation as they become involved in academic work. Two goals have received considerable attention from researchers: **mastery goals** (also called task or learning goals), and **performance goals** (also called extrinsic goals). Central to a mastery goal is the belief that individual effort leads to success, and the focus of attention is on the intrinsic value of learning. With a mastery goal, individuals are oriented toward developing new skills, trying to understand their work, improving their level of competence, or achieving a sense of mastery. Mastery goals and achievement are "self-referenced". In contrast, central to a performance goal is a focus on one's ability relative to others. Ability is shown by doing better than others, by surpassing norms, or by achieving success with little effort. Public recognition for doing better than others through grades, rewards and approval from others, is an important element of performance goal orientation. Performance goals and achievement are, therefore, "other referenced". Consequently, "self-worth" is determined by one's perception of ability to perform and compete successfully. Hence, when a student tries hard without being completely successful (in terms of the established norms) his or her sense of self-worth is threatened and motivation for learning is reduced.

It is often commonly thought that mastery and performance goals are mutually exclusive, that is, a child can be competitive or intrinsically motivated, but not both simultaneously. Recent theorising and research, however, challenges this and suggests that individuals may hold both mastery and performance goals which vary in importance and may interact depending on the nature of the task, the school environment and the broader social and educational context of the institution. Furthermore, students may hold multiple goals, over and above mastery and performance goals, each of which may impact upon their level of motivation for particular tasks. These multiple goals may interact providing a complex framework of motivational determinants of action.

For example, implicit in both mastery and performance goals is a focus on individualism where priority is given to the goals of individuals. Little attention is paid to group orientations such as working to preserve in-group integrity, interdependence of members and harmonious relationships. This social dimension of schooling (including the influence of parents, teachers and peers) may interact with both mastery and performance goals, and be extremely influential in affecting children's attitudes towards schooling in general and learning in particular.

It is commonly believed that indigenous children, such as those from Aboriginal and Navajo communities, are less likely to be motivated by individually oriented goals such as task and performance, while being more motivated by social goals that reflect their need to maintain group allegiance and solidarity. Furthermore, it is commonly believed that indigenous minority children are past and present oriented, and hence do not set goals for the future. As a consequence of this it is believed that these children seek gratification in the form of immediate payback for what they achieve rather than delaying gratification for the satisfaction of some future need. The research support for many of these contentions is very limited. A study of the multiple goals that might influence the school motivation of these children was, therefore, particularly important.

MAEHR'S PERSONAL INVESTMENT MODEL

There are many models of motivation but generally these tend to be relatively unidimensional, that is, concerned with narrowly focused determinants of motivation. As we have described above, goal theory has tended to be limited in this way to only two individually oriented goals. One motivational model, however, which proposes multiple goals for motivated action and which allows for the interacting effects of these goals is Maehr's Personal Investment Model. In its broadest interpretation the model conceptualises motivated behaviour as being determined by three global variables: personal incentives, sense of self, and facilitating conditions.

Personal incentives of behaviour in a situation refers to the motivational goals of the activity — importantly what a person defines as "success" and "failure" in a particular situation. Maehr proposes four broad goal systems which are presumed to be universal:

- task (or mastery) goals (such as experiencing adventure, novelty, or working to understand or improve at something),
- ego (or performance) goals (such as doing better than others or leading the group),
- social solidarity goals (such as pleasing others and being concerned for others' welfare) and
- extrinsic rewards goals (such as working for a recognition or a prize or reward of some kind).

Each of these various goals impact upon an individual's sense of competence, sense of autonomy, and sense of purpose in learning — and contribute to the motivational orientation of the individual.

> **These students... need to have effective feedback. They need to know if they are improving in their work....**

The second component of the model is defined by Maehr as sense of self, which refers to the more or less organised collections of perceptions, beliefs, and feelings related to who one is. Sense of self is presumed to be composed of a number of components such as sense of competence, sense of autonomy, and sense of purpose, each contributing to the motivational orientation of the individual and interacting with the motivational goals outlined above. The third component, action possibilities, refers to the behavioural alternatives that a person perceives to be available and appropriate (in terms of sociocultural norms and external factors such as geographic location and socio-economic status that exist for the individual) in a given situation.

The focus of this article is an examination of the relevance and applicability of this model to Australian Aboriginal and Navajo Indian students in school settings. In particular the article addresses the following questions:

- Are the dimensions of the Maehr model (multiple goals and sense of self) relevant to the Australian Aboriginal and Navajo groups?
- What are the most important goals of Australian Aboriginal and Navajo motivation as derived from this model and how do these relate to extant literature?
- How do these goals relate to important criteria of school motivation?

METHOD

Parental surveys

At the outset data were gathered on how Australian Aboriginal people conceptualise education and what they perceive as major issues in the underachievement of Aboriginal children in school settings. The data were obtained in three ways: personal interviews and group discussions with members of the Aboriginal community, written survey forms distributed to Aboriginal parents, and an examination of existing reports relating to the area of inquiry. In all, over one hundred Aboriginal parents were interviewed and 106 completed a written survey form.

For the Navajo group, consultations were held with members of the community, the Navajo Division of Education, and Indian Education Specialists. (It was not possible to interview Navajo parents at the time of the study, although this is recognised as an important element for future work). The results of these surveys are reported elsewhere.

Four hundred and ninety-six Aboriginal students were surveyed from years 7, 8, 9, 10 and 11 (12-16 years of age) from 12 high schools in New South Wales broadly typical of the types of country and city schools that Aboriginal children attend (for example, Redfern, Matraville, Dubbo, Nowra, Wellington). Five hundred and twenty-nine Navajo students from Grade 9 through to Grade 12 (14-17 years of age) were surveyed at Window Rock High School, a large high school situated on the Navajo Reservation.

A very important strategy was to include Aboriginal and Navajo research assistants, who not only facilitated the access of the researcher to community groups, but who also contributed to the research by their clarification of issues raised by the respondents.

Materials

The Inventory of School Motivation (ISM) was devised to reflect components of Maehr's Personal Investment model and to investigate the nature of school motivation in cross-cultural settings. The Inventory is broad enough to reflect the global dimensions of the model in a variety of cultural settings. Each dimension was broken down into two subsets as indicated below:

- **Task** (mastery): task involvement (example, "the more interesting the school work the harder I try"), and striving for excellence (example, "I try hard to make sure that I am good at my schoolwork").
- **Ego** (performance): competitiveness (example, "winning is important to me"), group leadership (example, "I often try to be the leader of a group").
- **Extrinsic:** recognition (example, "having other people tell me that I did well is important to me"), token rewards (example, "getting merit certificates would make me work harder at school").
- **Social solidarity:** social concern (example, "it is very important for students to help each other at school"), affiliation (example, "I try to work with friends as much as possible at school").

- **Sense of self:** sense of competence (example. "I can do things as well as most people at school"). sense of purpose (example. "it is good to plan ahead to complete my schooling").

The original items were designed in collaboration with an Aboriginal Consultative group established by the then National Aboriginal Education Committee (NAEC) and the New South Wales Aboriginal Education Consultative Group (AECG) to oversee the research. Furthermore, trial runs on the questions were conducted with members of the Aboriginal community enrolled in university subjects taught by the researcher as part of the Aboriginal Rural Education Program. The instrument was also reviewed by members of the Navajo community and Indian Education Specialists. Minor changes were made to reflect the Navajo (and United States) idiom.

SUMMARY

The studies conducted with the Aboriginal and Navajo students demonstrate that the multiple motivational goals drawn from the Personal Investment Model are applicable and relevant to the students surveyed. Furthermore, the Inventory of School Motivation has been able to suggest combinations of goals, together with sense of self variables, that appear most useful in predicting student performance and attitudes across a number of important school criteria.

Demonstrably important variables in predicting school students' retention, academic performance, valuing of school, and liking of school, are sense of self, sense of purpose, and the task goal. The sense of self refers to the students' self-esteem at school (that is, that they feel good about themselves as students); the sense of purpose means that they have a goal of doing well at school and getting ahead in life; and the task (mastery) goal refers to the fact that they strive for excellence and improvement in their work, and are intrinsically motivated. Factors which have been considered important by many as key determinants of Australian Aboriginal and Navajo children's poor achievement and dropping out of school, such as the supposed mismatch between the school's goals of competitiveness, individuality, and extrinsic rewards and the children's goals of affiliation, co-operation and non-competitiveness, were not supported by the findings.

IMPLICATIONS FOR SCHOOLS

There is considerable interest today in the ways schools communicate "appropriate" goals to students through the learning activities set, the evaluation methods utilised, and the power and authority structures employed. The following section outlines some implications from this research for schools teaching Aboriginal and Navajo children.

LEARNING ACTIVITIES

Clearly, indigenous children who are successful at school are task oriented. They seek high standards in their work, and are intrinsically motivated. To maximise the motivation to learn of Aboriginal and Navajo students, schools and classrooms should emphasise the intrinsic value of learning by developing programs that take advantage of the students' backgrounds and experience. In particular, these students (as with all students) need to have effective feedback. They need to know if they are improving in their work, and what more can be done to improve further. Furthermore, teacher and students should be perceived as partners in an all-inclusive group, rather than the teacher being perceived as an outsider and learning activities being set where it appears that students and groups are competing with each other.

A sense of purpose for schooling was found to be very important to these children. Teachers, therefore, should work with them to assist them to develop short term and long term goals, and to help them see the links between achieving particular goals and valued outcomes (such as gaining better grades, enjoying schoolwork more, obtaining employment or progressing to further education). Emphasis should be placed, therefore, on developing programs that stress personal goal setting and self-regulation, and that demonstrate the application of school learning in a variety of relevant non-school, "real-life" settings.

Emphasis should be placed on developing programs that stress personal goal setting and self-regulation.

Self-esteem as a student was also a very important predictor of school motivation and achievement. The higher the children's belief in themselves as learners the more positive were their academic marks, intention to complete school, and desired occupation after school. Self-esteem obviously influences the level of goal challenge these children set for themselves, the amount of effort they mobilise, and their persistence in the face of difficulty. Navajo and Aboriginal children traditionally appear to engage in significant self-directed learning. The opportunity for self-direction and self-regulation should, therefore, be enhanced through appropriate school and classroom practices. Giving children opportunities to initiate and direct their own learning through processes such as developing their own questions for class discussion, designing class projects, choosing learning partners, and deciding the order in which they wish to complete their work, are among the most powerful classroom applications that may enhance the children's positive sense of self as school learners. In particular, the classroom must provide opportunities for these students to enhance their positive view of self as students by providing them with opportunities to experience success in culturally meaningful and appropriate ways such as through co-operative or group testing.

METHODS OF EVALUATION

Because seeking for personal excellence in one's work and self-esteem as a student were two very important predictors of school motivation and achievement it is very important that schools and classrooms avoid establishing competitive evaluation practices which might undermine the intrinsic motivation and mastery orientation of these children. In particular, schools and classrooms should reduce emphasis on social comparisons of achievement by minimising public reference to normative evaluation standards (for example, grades and tests). Schools and classrooms should establish policies and procedures which give students opportunities to improve their performance (for example, study skills training) and create opportunities for students to assess progress towards goals they have set. In particular, procedures should allow students to progress at their own rate whenever possible.

School policies, practices, and initiatives which encourage the development of group rather than individualistic learning situations, and structure learning around supportive peer interactions should also be encouraged as they have a strong potential to enhance the academic performance and retention of Aboriginal and Navajo children at school. Teachers should make positive use of the peer group. For example, all students could engage in informal forms of peer tutoring and this could be encouraged in culturally appropriate ways. Success-oriented peer groups could be utilised as effective models. Assigned work could be a group task which implements co-operative goal structures rather than an individual task. Students should be encouraged to practise skills outside the public arena until the task can be performed competently. Furthermore, teachers should provide culturally sensitive opportunities for students to assess progress towards goals which they have set for themselves.

CONCLUSION

Classrooms and schools should emphasise task (mastery) goals, they should encourage the development of a positive sense of self as a student, and foster programs that stress goal setting. In particular schools and classrooms should provide their students with experience in personal goal setting and in monitoring progress in carrying out plans for goal achievement. Unfortunately, many schools and classrooms emphasise performance and extrinsic goals through competition and social comparison, ability grouping and tracking, public evaluation of performance and conduct based on normative standards of performance, and give children little opportunity to co-operate and interact with other children or to choose the tasks that are of most interest and relevance to them.

In contrast, classrooms and schools that emphasise task (mastery) are likely to group students according to interest and needs, allow flexibility in choice of activities and in opportunities for student initiative and responsibility, define success in terms of effort, progress and improvement, put an emphasis on the value and interest of learning, and give opportunities for peer interaction and co-operation. Aboriginal and Navajo children in these classrooms are likely to be highly motivated, set themselves meaningful and challenging goals of achievement, and persist at these tasks for the perceived benefits that will accrue to them.

NOTES

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Full details of the research methodology used in this study can be found in:

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RESEARCH INFORMATION FOR TEACHERS
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4

SPELLING INSTRUCTION IN PRIMARY SCHOOLS

Barbara Brann, UNITEC Institute of Technology, Auckland

Writing (and therefore spelling) provides lasting evidence of a person's ability to express his/her thoughts and knowledge, and society has been quick to judge those for whom these tasks are difficult. Nonetheless, despite the inordinate amount of research on spelling in the educational literature, very little attention has been given to the degree to which these findings have been implemented.

This article reports on a study which investigated whether teachers' views on teaching spelling reflect the current research and looks at the ways spelling is taught in primary schools.

The study involved a survey which was based on research in three areas: how proficient spellers generate spellings for known and unfamiliar words; the stages through which children's spelling progresses in their acquisition of spellings skills; and how feedback to students affects their accuracy in their spelling.

The survey form was given to 110 teachers chosen from 14 randomly selected government and integrated primary schools in central Auckland suburbs. Eighty of the teachers were from ten government schools and 30 teachers were from four Catholic schools. An equal number were teachers of juniors (aged 5-8 years) and seniors (aged 9-12 years). The majority of the teachers surveyed were women (80 percent), which is representative of the general ratio of teachers in primary schools in Auckland.

The survey form was divided into two sections. The first contained 11 multiple-choice questions concerning spelling methodology. The questions were not mutually exclusive, and no answers were "incorrect". One of the responses, however, was deemed to reflect the research more than the others and was therefore considered by the researcher to be the most appropriate response. Teachers were asked to select the response that was closest to, or best described, what they were doing in their programmes.

The second section contained questions relating to background information on the teachers participating in the survey such as the teachers' personal teaching histories, level and types of training, class levels and types of schools.

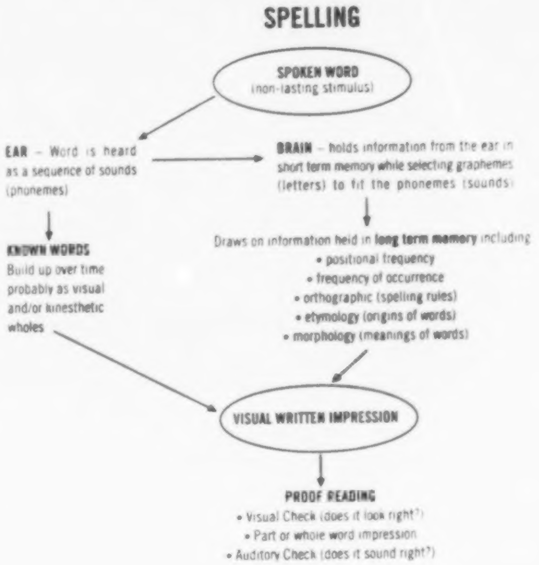
BACKGROUND RESEARCH

The research into the development of children's spelling skills indicates that as children become more aware of the conventions of the orthographic (spelling) system, they apply the information to their writing: that is, they develop a spelling consciousness which appears to progress through a number of stages characterised by the types of "errors" made in their spelling attempts. These errors are therefore indicators of a child's level of progress rather than mistakes as such.

The research into proficient spelling also indicates that the processes by which proficient spellers produce correct spellings and generate spellings for unknown words are related to the amount of information they have about the orthographic system. *Proficient spellers not only know how to spell many whole words, but they know a great deal about the way the spelling system works and are therefore able to generate correct spellings for new and unfamiliar words.* Complete words build up in long term memory and may be reproduced as visual wholes or even as motor patterns. When proficient spellers need to write unfamiliar words, however, they demonstrate that they move through the same hierarchy of skills that developing spellers do when they attempt to write words which they cannot spell from memory.

Learning to spell therefore involves acquiring information and strategies rather than rote learning of individual, unrelated words.

MODEL OF SPELLING PRODUCTION (BRANN 1991)


SPELLING
SPOKEN WORD
(non-lasting stimulus)
EAR – Word is heard as a sequence of sounds (phonemes)
BRAIN – holds information from the ear in short term memory while selecting graphemes (letters) to fit the phonemes (sounds)
KNOWN WORDS
Build up over time probably as visual and/or kinesthetic wholes
Draws on information held in long term memory including
• positional frequency
• frequency of occurrence
• orthographic (spelling rules)
• etymology (origins of words)
• morphology (meanings of words)
VISUAL WRITTEN IMPRESSION
PROOF READING
• Visual Check (does it look right?)
• Part or whole word impression
• Auditory Check (does it sound right?)

This model shows the word the writer wishes to write as being received in the auditory channel (by the ear) whether the word is spoken aloud or sub-vocalised by the writer. The information is received as a sequence of sound units (phonemes) which the brain then holds in sequence, in short term memory, long enough for the writer to attempt to write it.

This may be done by either recalling the whole word, visually or kinesthetically (through the feel of the writing) *or* by choosing appropriate letters (graphemes) to represent the sounds (phonemes) identified if it could *not* be spelled from memory. This choice is based on the writer's knowledge of orthographic information such as frequency of occurrence (for instance, the use of "qu" rather than "kw"), positional frequency (for instance, "ay" occurring at the end of a base word rather than in the middle), meaning, derivation and spelling rules or generalisations. Often the choice is made on the basis of analogies to known words ("sounds like" so therefore probably "looks like").

The more information a writer has about the way the spoken and written language is constructed, the greater will be the number of options available to him/her, and the greater his/her awareness will be of what is likely to be the most appropriate choice of letters for a given word.

In the final process, the letter or letters (graphemes) are written and checked visually against what the writer already knows (does it look right?) or against an external source such as a dictionary.

As children learn more about the orthographic system, more information will be applied when making choices for letters to match the phonemes (sounds) analysed. Strategies for determining choices become more comprehensive as children learn more, until they are using sophisticated strategies such as analogy to known words to generate the correct spellings of unknown words.

If spelling programmes in schools are to reflect research findings they must:

- Aim to increase childrens awareness of the way the orthographic system works by providing information from which they can draw analogies and make generalisations.
- Concentrate on improving the strategies children use to generate correct spellings for unfamiliar words. (This should be based on the way proficient spellers generate spellings for unfamiliar words.)
- Reflect the developmental nature of spelling and insist that errors should be regarded as indicators of children's level of development rather than as mistakes.

The research into the types of feedback which are most likely to result in improvement in spelling awareness and which are most likely to promote positive learning indicates that feedback is most successful when it is specific, positive, and contains information which the student can use to generate correct responses in the future. This suggests that within the writing context teachers should respond to children's spelling attempts positively, pointing out specific correct spellings and partial spellings in order to encourage the repetition of the correct aspects of the spelling attempts.

Feedback should be accompanied by praise and reward for successive correct attempts and for application of strategies and knowledge.

Evaluation of children's on-going spelling progress is most appropriately undertaken by using tests of spelling information and knowledge such as sound to letter correspondence or knowledge of word endings. Spelling is a developmental process and the level of development is reflected in the information children have about the orthographic system. Teachers need to be aware of the level of development of their students in order to assist them to progress. The number of whole-word spellings a student can produce does not provide the teacher with this information, whereas knowledge about the orthographic system and the ways in which letters map the sounds and meanings of the language is important to the writer's ability to generate new or unknown spellings for words. Often children who are labelled poor spellers are overly reliant on simple sound to letter correspondences or on visual, whole-word information which may be incomplete or confused. They have not internalised the underlying patterns, rules and constraints which govern the writing system and are therefore unable to generalise the information.

RESULTS OF THE SURVEY

The responses for each question were analysed and the number of appropriate responses calculated.

The results indicated that more than 50 percent of teachers scored less than four "appropriate" responses out of a possible eleven, with only eight teachers scoring seven or more "appropriate" responses. The overall mean was 3.5 (sd=2.1). It appears from the survey, therefore, that the major research findings are not being implemented in classrooms.

The analysis of individual questions indicated that most teachers use individual lists of words based on personal errors as the basis of spelling programmes, mark all incorrect spellings as errors, evaluate progress by keeping a file of writing samples, or do not test at all. The majority of teachers (56 percent) indicated that they marked all incorrect spellings as errors while a further 30 percent indicated that only incorrectly spelled high frequency words were marked as errors. This suggests that a great majority of teachers regard misspellings as errors rather than as spelling attempts in a developmental process.

The teaching group scoring the highest mean scores were those who were trained in Reading Recovery theory and methodology. All Reading Recovery teachers in the survey were female, and all taught in junior classes. The survey indicated a significant difference in the level of understanding and awareness of the developmental process and acquisition of spelling skills between junior and senior class teachers, with junior class teachers scoring significantly higher than senior class teachers. Female teachers scored higher than male teachers irrespective of the class level.

The survey indicated that teachers' understanding and application of current research into spelling are not significantly affected by the type of school in which he or she teaches, the level of qualifications held, whether he or she has special education training, the length of teaching experience, or the number of years since training.

In analysing the responses to the question regarding types of programmes used, the most appropriate" response, "words based on sound and/or letter and/or morphemic (meaning) patterns" received the least support, and not one senior class teacher selected this response. In addition, there was little consensus about the type of programming used throughout classes and schools generally, although most favoured were individual spelling programmes based on personal errors. Teachers in the senior classes are more likely to teach spelling through an error-

The following TEACHING/LEARNING procedure is recommended for all students:

- SAY THE WORDS ALOUD — pronounce them slowly. Ensure that students have a good model for the "standard" or "correct" pronunciation of the words.
- LISTEN TO THE WORDS — what can you hear the same in them?
- LOOK AT THE WORDS — what can you see the same in them?
- IDENTIFY THE CONNECTION between the visual and the sound patterns in these words.
- EXAMINE THE MEANINGS of the words and the patterns of language into which the words fit. Study verb families, other parts of speech from the base word, opposites, synonyms, other meanings in different situations and so on.
- COVER THE WORDS, then:
- WRITE THE WORDS from memory. Never copy them.
- CHECK by comparing the correct version with the word written from memory.
- COVER, REWRITE AND RECHECK if necessary.

These final three (Cover, Write, Check) will teach students recall and proof reading strategies.

SUGGESTIONS FOR TEACHING

- Always teach spelling WITHIN THE CONTEXT OF LANGUAGE (not just as lists or words in isolation).
- TEACH PHONEMIC AWARENESS (the ability to manipulate the sounds of the language) to beginning writers as a pre-requisite skill to writing and spelling production.
- ENCOURAGE STUDENTS TO WRITE FROM THEIR OWN KNOWLEDGE BASE (invented spellings) using sound-to-letter strategies to generate the spellings of unknown words rather than copying them from charts or dictionaries.

based approach with little reward for correct spellings or for correct applications of strategies. Junior class teachers, however, demonstrate greater awareness of the developmental process of spelling acquisition and are more likely to base their teaching approach on positive reinforcement and reward.

DISCUSSION

The results from this study indicate that findings from research into the development of spelling awareness in children, the production of correct spellings and the ability to generate new spellings for unknown words, and the type of feedback most likely to result in positive learning, are not widely applied in spelling programmes in Auckland primary schools — at least not according to the perceptions of the teachers.

Significant differences were found in responses on the basis of gender, class level and whether or not teachers were Reading Recovery trained. Female teachers of junior classes, especially those who were Reading Recovery trained, were more likely to incorporate information from research into their spelling and writing programmes. Male teachers and teachers of senior level classes indicate significantly less understanding of the developmental processes of spelling and are more likely to base their programmes on an error-based approach with little reinforcement for correct application of strategies or skills. The survey did not locate one senior class teacher operating a programme considered to be based on acquisition of knowledge of the orthographic system. In addition, the junior class teachers were far more aware of the importance of phonemic analysis skills that underpin successful spelling strategies than their senior counterparts, who tended to believe that spelling is a consequence of storing words from reading, learning from errors, and having visual recognition skills.

Although many teachers "correctly" answered the questions relating to rewarding phonetic analysis and spelling strategies, they did not appear to be so willing to implement these approaches in their teaching programmes. In addition, there is a major discrepancy between what teachers agree that they, as adults, do when they need to generate spellings for unknown words, and what they believe children do.

Further, there is a discrepancy between what teachers say is important to the development of spelling awareness and what they then evaluate to measure progress. The most appropriate approach, given the research, would be to keep records of strategies children use to generate new spellings for words they are unable to write from memory; however, only four teachers claimed they evaluated this way. Thus, even when teachers are aware of the research findings, they do not translate the findings into classroom practices.

The introduction of process writing into schools has focused attention on the processes of writing and encouraged children to express themselves freely without being constrained by inadequate spelling skills. This approach allows children to invent spellings on the basis of the amount of information they have about the orthographic system and rewards successive attempts. Nonetheless, senior class teachers are continuing to operate with programmes largely based on learning individual words based on error or interest lists. However, if teachers could appreciate that there is often a rationality in the nature of errors and spend more time analysing the "logic" in the errors, then a great deal of understanding about children's knowledge and understanding of the orthographic code could be derived. The preoccupation with errors seems to stem from a lack of understanding of the processes children use to produce spellings for unfamiliar words. A recommendation from the research is that teachers need to be encouraged to analyse children's spellings to discover the meaning and significance of the errors.

Junior class teachers appear to be applying the process writing approach to their programmes to some extent.

Teachers generally have limited understanding about spelling acquisition and about feedback to students in the process of teaching writing. Information about research into spelling production and development is either not reaching most classroom teachers or is not being put into practice in classrooms.

PLANNING SPELLING PROGRAMMES FOR STUDENTS

While some children may learn to write by writing, and to spell by reading, most children need guidance and direction to hear and see the patterns which exist in the orthographic or spelling code, and need to be taught strategies to generate spellings for the words they wish to write. These strategies need to be taught through a programme of word study and not through reading.

THE FIRST STRATEGY — SOUND ANALYSIS AND PHONEMIC AWARENESS

The research indicates that the most sophisticated strategy used by proficient spellers to generate possible spellings for unknown words is that of analogy to known words: that is, "sounds like so therefore probably looks like".

The ability to hear the similarities in the sounds of words, that is, to use efficient sound analysis, is therefore at the basis of all proficient spelling. Recent research indicates that "phonemic awareness", the ability to work with the sounds of the language, is a most critical skill for developing readers and writers.

- **TEACH PROOF READING AND CHECKING SKILLS**, including the use of an independent editor for older students.
- **TEACHERS SHOULD ACCEPT ALL SPELLINGS** — there are no "errors", just closer and closer approximations to the standard spellings of words, and careless mistakes, often caused by poor proof reading.
- **TEACH SPELLING THROUGH WORD GROUPINGS** at all levels so that students understand the consistencies of the language and they can make informed generalisations about the spellings of words.
- **MAKE SPELLING A PART OF WORD STUDY** rather than an end in itself.
- **KEEP ALL INSTRUCTION WITHIN THE MEMORY SPAN OF THE STUDENT**. Overload will cause confusion and anxiety, two of the major contributors to learning difficulties.
- **KNOW YOUR OBJECTIVE** and do not confuse handwriting and spelling practice with imaginative story writing.
- **WRITE OFTEN AND A LOT**. The more practice students have in the writing process and in applying spelling processes the more they will learn about the way the language works.

Remember that students who write a lot get plenty of practice from which they develop strategies and build up stores of whole words in their memories. This enables them to become proficient spellers. However, poor writers who write little, get little practice and thus develop fewer strategies and learn to spell fewer whole words. Many of these writers learn to dislike writing, see themselves as failures, choose to write less, get less practice and therefore learn less about word spellings.

NEXT — CHOOSING LETTERS TO MATCH THE SOUNDS

In order to make the connection to known words on the basis of "sounds like so therefore probably looks like" the writer needs to have a sufficient store of similar sounding and similarly spelled words in memory from which to make the connection. It is essential, therefore, that children be given numerous specific examples of words which fit the same sound-to-letter patterns and that they be given the opportunity to explore groups of similar sounding/spelling words so that they learn about frequency, positional frequency, meanings, derivations, and rules and generalisations which govern the written language.

FINALLY — PROOF READING — A VISUAL STRATEGY

Proof reading is the final strategy used in the process of spelling production. This is usually a visual skill — that is, we ask ourselves "does the word look right?" In order to proof read, we need to have been exposed to the correct spelling of the word often enough for us to make a judgment about the correctness or otherwise of our spellings.

(Adults often believe that spelling is a visual skill because they can tell if it is correct or otherwise by looking at it. This is possibly why many teachers tell children to learn the word by looking at it. However, spellings do not originate from a visual source, they begin with sounds).

THEREFORE —

- A word study/vocabulary programme which will provide a ***multi-faceted, multi-sensory approach*** will be beneficial for students of all ages.
- Words to be studied should be organised in ***phono-graphic groupings*** in order to provide as many cues as possible for learning (for example, words ending in "ay"; words ending in "tion"; words containing "qu"; words beginning with "psy").
- A programme which will encourage students to ***explore their language*** from as many different viewpoints as possible, and which will make them curious about the meanings and the structure of the language, will develop a greater spelling awareness than will learning lists of unrelated words or having them learn correctly words which they have spelled incorrectly.

NOTES

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Training in the use of The Brann Analysis Grid for Spelling is offered to schools. Further information regarding training or sale of the Grid is available through the BMB Educational Consultancy, P.O. Box 33 1070 Takapuna, Auckland, New Zealand. (Ph./Fax (09) 410 8257).

Further details of the study described here can be found in:

Brann, B. & Hattie, J. (1995). Spelling instruction in primary schools. *New Zealand Journal of Educational Studies, 30*(1), 39-49.

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The model of spelling production is from:

Brann, B. (1991). *Teacher's use of the developmental theories of acquisition and production within process writing in primary schools.* Unpublished dissertation, University of Western Australia.

The importance to a writer of knowing how language is constructed is quoted from page three of:

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The final process of visually checking words against what the writer already knows is documented in:

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The recommended teaching/learning strategy is from:

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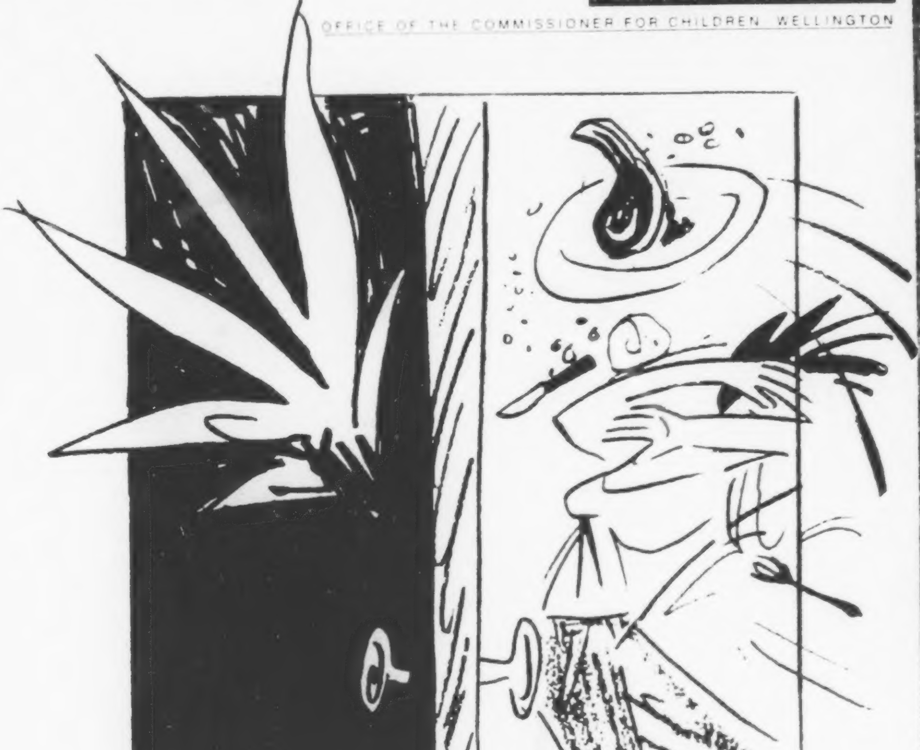
Family Violence and Children:

HOW SCHOOLS CAN RESPOND

PAULA SHEPHERD
OFFICE OF THE COMMISSIONER FOR CHILDREN, WELLINGTON



ADELE JACKSON

FAMILY VIOLENCE IN NEW ZEALAND

Family violence is gaining recognition as serious issue in New Zealand. Nevertheless, it still remains a very hidden problem, often not reported to police. Information from several New Zealand sources gives some idea of the problem. New Zealand Police estimate up to 80 percent of all violence is domestic related. In 1994, over 5000 women stayed in Women's Refuges throughout New Zealand, bringing nearly 8000 children with them. Women's Refuges also assisted nearly 4000 women and 4000 children who remained in the community. Moreover, there are likely to be many other women who are physically abused but who do not seek help.

Family violence can end tragically in death. Most homicides occur in or around the home and are committed by someone who knows the victim. In New Zealand during 1978-1987, 40 percent of all homicide victims knew their assailant through an intimate relationship, such as marriage, or as a family member. In most of these cases the victim was a woman. Where homicide victims were children, in two–thirds of the cases the assailant was the child's parent or guardian. This information and figures from Women's Refuge and New Zealand Police indicate that family violence is a severe problem from which children are not isolated or excluded. Furthermore, research suggests that most battered women are mothers. Consequently, there may be large numbers of children who are living in homes characterised by family violence.

CHILDREN'S EXPERIENCE OF FAMILY VIOLENCE

Mothers may minimise or even deny their children's involvement in family violence, believing that they are asleep or unable to hear the abuse while they are in their bedrooms. However, children's reports of family violence demonstrate that children can fully describe assaults that their mothers had no idea children were aware of. Furthermore, even if children do not witness the abuse they will see the consequences —their mother's pain and injuries.

Data collected from Hamilton Abuse Intervention Pilot Project (HAIPP) indicates that children in violent homes are very likely to witness spousal abuse. The data was compiled from family violence incidents which the police had attended. The analysis revealed a number of disturbing findings about the experiences of children in these violent homes.

- In 62 percent of the incidents the victims had children in their care.
- In 87 percent of these cases, children were at home at the time of the incident, and usually witnessed the assault.
- In 19 percent of cases where children were present they were also physically abused or were the principal victims of the attack.
- In cases where children witnessed the assault, 10 percent tried to intervene and 6 percent attempted to get help.

In addition, statistics from the National Collective of Independent Women's Refuges indicate that 90 percent of children staying at Women's Refuge had witnessed violence in the home. These findings support those of an earlier Christchurch study by Church. Of a group of 228 children from violent homes, mothers reported that 86 percent of children had been exposed to violent conflict from their earliest years. These reports reveal children are very much involved in family violence, often witnessing horrifying acts of violence as well as sometimes being injured themselves.

RISK OF PHYSICAL ABUSE

Marital violence is very strongly associated with child abuse. Furthermore, when children try to protect the victimised parent their risk for physical injury is likely to increase considerably. Children are not at risk just from their fathers. Child abuse can result from aggression when an angry, frustrated, powerless parent misdirects hostility intended for the abusive parent onto the even more powerless child.

RISK OF NEGLECT

Children living in violent homes are also at risk of neglect. Battered women may be unable to support or nurture their children because of their own victimisation. They may be barely able to cope with their own emotional and physical survival. Women who have been abused are often battling their own problems which can include depression, anxiety, and helplessness. The distress of children exposed to family violence is likely to increase when the assaulted parent is unable to reassure or comfort their children.

CONSEQUENCES OF LIVING IN A VIOLENT HOME

Family violence produces an environment of multiple stresses and difficulties for children, not the least of which include:

- living in an atmosphere of fear of the next conflict or assault;
- fear of injury to their mother and themselves;
- possible scapegoating of children or manipulation by parents to take sides;
- an atmosphere of unreality and confusion if violence is down-played or ignored by parents;
- a confusion for children if violence alternates with some loving periods between parents;
- repeated separations from a parent and disruption in the child's home and school environments;
- struggling to be "super children" in an attempt to make their mother's life easier and/or stop conflict at home;
- being burdened with adult responsibilities that their mother cannot cope with, for example, caring for younger siblings;
- taking on guilt and blame both for causing the violence and for not being able to stop it.

THE IMPACT OF FAMILY VIOLENCE

Research and clinical literature have only just begun to uncover the possible negative consequences for children living in a home where there is violence. Children who observe violence and who experience any type of abuse risk having behavioural and developmental problems.

EMOTIONAL AND BEHAVIOURAL PROBLEMS

Much of the research investigating the impact of family violence on children has been consistent in identifying problems likely to be experienced by children. These include:

- suffering shock, distress, and confusion;
- developing low self-esteem and depression;
- becoming quiet and withdrawn, and crying a lot;

For the purposes of this article, family violence refers to the use of physical aggression against other family members living in the same household. It is recognised that in the majority of cases, serious family violence is perpetrated by males against their female partners. In addition, it is likely that in a family where there is physical abuse there is also psychological abuse. Psychological abuse may include the following types of behaviours: humiliation or degradation, restriction of social contacts, intimidation, use of threats, and restriction of financial resources.

- being anxious, scared, and feeling powerless and insecure;
- becoming aggressive and violent;
- having problems at school with studies;
- having difficulty getting on with other children;
- having sleeping problems, nightmares, and wetting the bed;
- health complaints such as stomachaches, headaches, and asthma;
- hyperactivity and lack of control;
- conduct problems such as delinquency, truancy, and stealing.

For instance, an investigation into the occurrence of behavioural and emotional problems of children staying at a women's refuge found that children who had witnessed violence were two and a half times more likely to have behavioural and emotional problems needing clinical help than those children in the community who had not witnessed violence. Forty-seven percent of boys and 36 percent of girls fell within this clinical range of behaviour problems.

In addition, children who have witnessed parental violence and children who have both witnessed and been physically abused exhibited lower self-esteem, higher levels of distress, and higher levels of anxiety than a group of children from nonviolent families.

ACADEMIC PROBLEMS

Children exposed to family violence may have problems with concentration and control and, as a result, school work may suffer. Investigators have found that children from violent homes scored significantly lower on tests of mathematical and reading abilities than children from nonviolent homes. Similarly, studies show that the reading age of children exposed to violence is significantly lower than their chronological age, when tested for both accuracy and comprehension. In contrast, other children may do very well at school, trying very hard to please their parents.

SOCIAL COMPETENCE

Children from violent homes may also have difficulties with social interaction. Children who bully, intimidate, and threaten may be displaying behaviours they have seen at home. These children do not know how to interact appropriately and suffer isolation as a result of their behaviour. In contrast, other children may become passive in any social relationship and view their own actions as ineffective when interacting with more powerful children. Avoidance of social interaction may be adopted, which maintains and increases fear and alienation. In addition, children of battered women have been reported as performing at a significantly lower levels on measures of empathy than children who are not from violent homes. It has been suggested that deficiency of empathy skills may be predispose children to poor interpersonal relationships and inhibit the development of intimate relationships.

LONG TERM IMPACT

Children who witness violence often have inappropriate attitudes about violence. Research has shown children exposed to violence were more likely to condone violence as a means of resolving conflict in human relationships. Children exposed to family violence are likely to learn a number of things from violent parents, for instance, that:

- those who love you also hurt you;
- violence has a place within family interaction;
- violence is an appropriate and successful means of problem solving conflict resolution;
- violence is an appropriate means of stress management;
- violence is a logical conclusion of a conflict in a relationship;
- victims of violence should, at best, tolerate this behaviour, and at worst, examine their responsibility in causing the violence;
- if violence is reported to others in the community, including mental health and criminal justice professionals, there may be few, if any consequences.

What children learn from involvement in family violence may place them at risk for subsequent poor and/or violent interpersonal relationships. Children exposed to family violence may become adult abusers or be abused themselves in adulthood. Research on adult spouse abusers has reported that they were more likely than their nonviolent comparison to have observed violence between their parents.

AGE AND GENDER

Research findings conflict regarding the different effect that gender and age may have on the impact of family violence on children. It has been suggested that younger children are more likely to respond to family violence with health complaints such as wetting the bed, headaches, stomachaches and diarrhoea. Older children are thought to respond with more sex stereotypical ways — boys reacting with aggressive behaviours and girls responding with more passive and anxious behaviours. However, the research is not conclusive and not all children will be affected in the same way as there are a variety of factors which may contribute to the impact of family violence.

HOW SCHOOLS CAN RESPOND

Children in violent homes are often very isolated from any contacts, support, or activities outside the home. It is possible that school is the only place where their need for help or protection is identified. If a child discloses information about family violence teachers should:

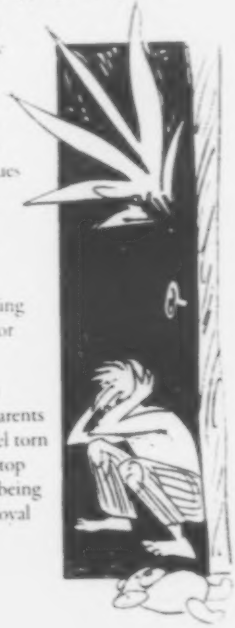
- listen calmly without overreacting to the child's disclosure;
- reassure the child that they are not to blame;
- be supportive;
- act to protect the child by referring to the appropriate authority when this is required;
- not guarantee confidentiality or a quick fix.

It is important for schools to develop family violence policies and community networks. Teachers should not be expected to act as therapists nor should they be expected to act alone. Teachers should have the support of the school and appropriate resources to call upon in order to make referrals and report dangers.

In developing guidelines to meet the individual needs of children it may be necessary to provide an overall school climate conducive to successful intervention. This can be achieved by implementing programmes within schools which educate children from primary level upwards about family violence and nonviolent ways of conflict resolution and problem solving. North American schools in several areas have successfully put in place such curriculum materials and complemented this by networking with appropriate agencies.

On an individual level, teachers can respond by being aware of the problem of family violence and its effects on children. Also, they need to be aware of issues likely to be salient for children. These may involve the following:

- feeling personally responsible for causing violence as well as for stopping it;
- confusion and guilt about loyalties to parents — children may feel torn between trying to stop their mother from being hurt and being disloyal to their father;



- ambivalence toward parents — children may resent their mother because of her inability to protect herself or the children and disapprove of their father's violence;
- feeling frightened of their own anger — children have learned that violence is an inevitable consequence of anger and may fear that they will be violent.

Teachers should not be lenient or tolerant of a child's aggressive behaviour in an attempt to compensate for their harsh home life. Teachers should respond firmly to coercive and aggressive behaviour to teach children that violent behaviour is unacceptable. In addition, it is important to provide structure and boundaries to the child's time at school as a balance for possible turmoil at home.

It may be difficult for children to talk about their feelings and experiences of family violence, in which case indirect methods of communication may be useful. Creative activities such as art can allow children to communicate their home difficulties. Also, games about different sorts of feelings may provide children an outlet for what has happened to them.

NOTES

PAULA SHEPHERD is a post graduate student at the Psychology Department at Victoria University of Wellington. This paper was written on behalf of the Office of the Commissioner for Children as part of a group of studies.

Evidence for the preponderance of serious violence by males against their female partners comes from:

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The links between physical and psychological abuse are noted in:

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SCHOOL-BASED INTERVENTION

Peter Jaffe, a prominent psychologist in the area of children and family violence, can be contacted at London Family Court Clinic, 254 Pall Mall St, suite 200, London, Ontario, N6A 5P6, Canada. The clinic offers an anti-violence school based initiative which includes a manual and video. Other programmes are available in Australia and the USA. For further information see Maxwell (1995).

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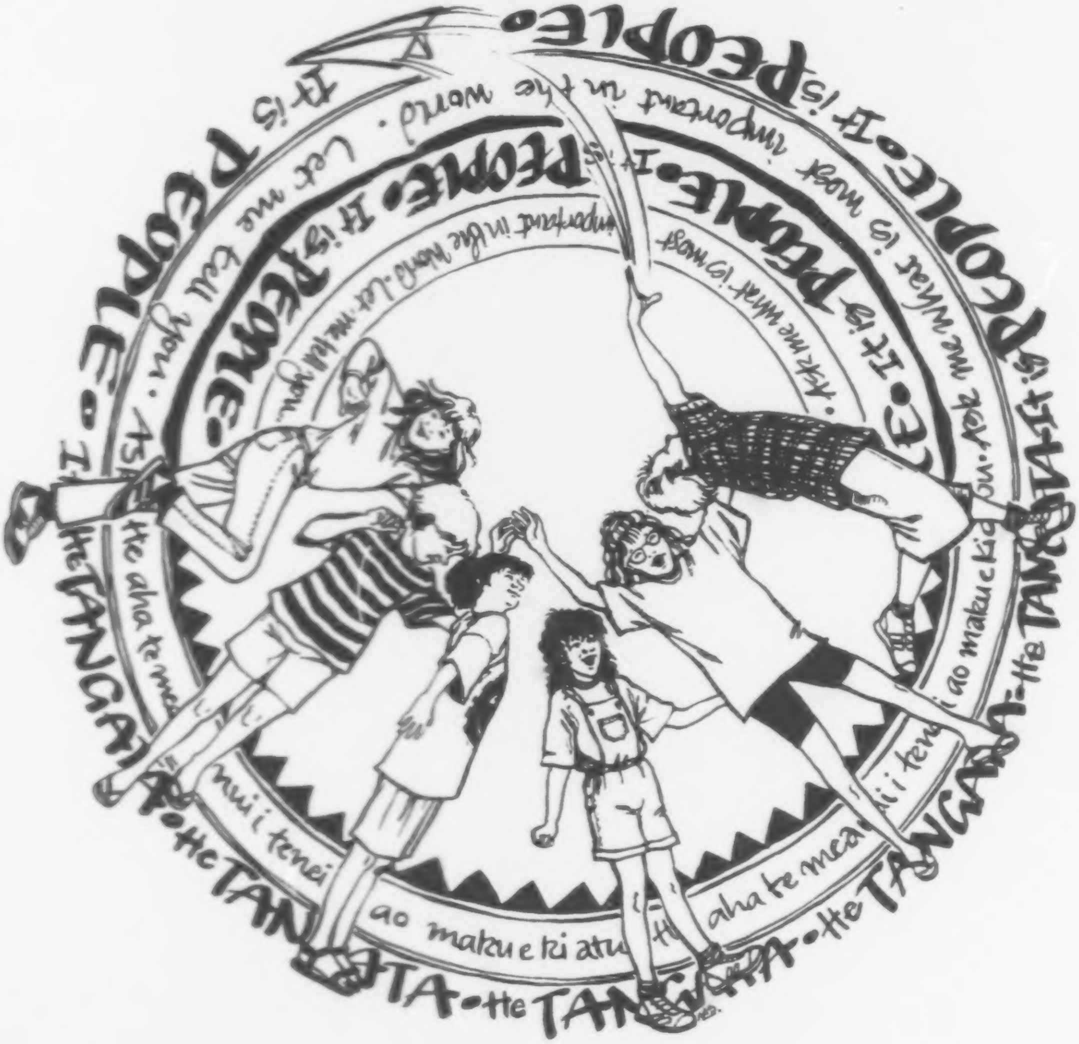
set one, 1996
6

The Dynamics of SUPPORT Circles

Patrick Mackan and Roslyn Cormier
Centre for Integrated Education and Community, Toronto


It is PEOPLE. It is PEOPLE. It is PEOPLE. It is PEOPLE.
Ask me what is most important in the world. Let me tell you.
He aha te mea nui i tenei ao maku e ki atu
He TANGATA. He TANGATA. He TANGATA.

He aha te mea nui i tenei ao
Maku e ki atu
He tangata, he tangata, he tangata

Ask me what is most important in the world
Let me tell you
It is people, it is people, it is people

Friendship is what carries us over the waters of life. Everyone needs friends. Human life and growth is meaningless without them. A group of Grade 4 (9 year-old) children in Stratford, Ontario, described the importance of friends in this simple way:

> Friends play with us, share with us, help us, cheer us up, care for us, go out of their way to help us, talk to us, make us feel special, stick up for us, and listen to us.

AS MORE Canadian schools are registering students with disabilities in regular classrooms, the needs and dreams of these students call for support from fellow students. Classmates are invited into the life of the student with disabilities in order to meet the need for acceptance and belonging. The role of a support friend is to enhance that possibility. Support circles increase the enrichment of classroom life and provide opportunities for friendship and community involvement. Support circles are appearing across the entire kindergarten to grade 12 spectrum. In the early grades they are less structured. Everybody seems to be part of the class and young children just naturally accept one another. As children get older, the support circle of friends becomes more structured. Although each situation and child is unique, beginning at about grade 4, the support circle has to be intentionally designed.

The establishment of support circles is simply a specific invitation for students to come into the life of another person who needs their love and concern in order to grow and develop. Any student can respond to the invitation to be involved. Support circles seem to attract people who like people. Very often the most unlikely students consent. It has surprised many teachers as to who volunteers. In Ottawa, a school troublemaker became the most committed advocate to the support circle concept. In general, there will be as many reasons a student answers an invitation to come into a support circle as there are students who respond. It may be a value system, a personal experience, a perception of justice, a sense of compassion, or a feeling for what it must mean to be isolated. Some may come forward out of their own need to love or to be loved. Some students seem to have an intuition that sees the person rather than the disability. Some may see the disability first and only later see through it to the person. But whatever the reason, we can never predetermine the quality of the response. The best bet is to just take the responders as they are. It will be this cake mix of motives that will produce beautiful fruit in the growth of the support circle. It will be all these different reasons underlying the response that will energise the circle itself.

To get the right mix of students we must take care not to define the purpose of the circle too specifically. It is best seen as a call into another person's life.

THE CREATION of the support circle begins with listening to the story of the person with special needs. Someone who is familiar with the story relates it to a class or group of students. The story highlights the isolation and segregation that has been in the life of the person. Here is truly someone who needs friendship. In essence, fellow students are invited to be a part of this student's life. This is not a call for volunteers to help, but a cry to love another person by coming into that person's life. This is an invitation to a relationship.

Our experience in schools across Canada suggests that the story, once heard, elicits in the listener some expression from his or her own life experience. Students who join support circles often know themselves what it is like not to be loved, to be alone, to feel rejected. Paul, a student who acted out in bizarre ways to gain attention resisted all protestations that he was loved until he experienced the presence in the school of Samuel, another student with very profound disabilities. When Samuel was seen to be really accepted and loved, Paul realised he, too was loved. Paul's bizarre behaviour came to a dramatic end.

Again and again there is evidence that responding to the invitation to enter into a meaningful personal relationship with another human being comes from a deep need within the self for personal growth and meaning. The support circle provides a unique environment for learning about self and others that no other school programme can match. The wisdom of bringing all children together for their schooling is providing a quality education for all students in many dramatic ways.

IN MOST CASES, more students respond to the invitation to join a support circle than are going to be required. In one high school in Mississauga 70 came forward (while only 40 were deemed necessary for the forming of five circles). Techniques and methods in forming circles have been developed and address such an issue as this. In this article, the dynamics of circles are being highlighted rather than technique.

The whole process of establishing support circles requires a facilitator if the circle is to achieve its maximum benefit. Usually, the facilitator is a staff member of the school community. This could be a teacher assistant, a regular teacher, a special education person, a chaplain, or one of the school administrators. In each case,

the facilitator volunteers for the task. The person involved in facilitation must not only see the enormous benefit of the support circle but must also be committed to making it work. A good facilitator will act as yeast which allows all the ingredients of the group to come to fruition. A poor facilitator can be an oven door slamming, causing the mix to fall and be ineffective. The good facilitator allows the group to empower itself and to take control and responsibility for their role as a support vehicle. The support members are encouraged to use their own insights with the guidance of the facilitator.

Once formed, the support circle needs to meet regularly. They constantly need to work out the dynamics of the circle. At the group meeting members discuss how they can include their friend in upcoming school events and social get-togethers. They seek ways to broaden the possibilities for friendship. The facilitator, as a representative of the school, assists in making these things happen. Often, there are initial problems and these need to be discussed and solutions sought.

In Ottawa, a student previously labelled "trainable mentally retarded" and segregated for ten of his school years, had difficulty behaving properly in the school cafeteria. The large group of students at lunch fascinated him. He would roam all over the cafeteria helping himself to french fries. The support circle discussed the situation and found a simple solution. They paired him with a friend he greatly admired. No more french fry stealing.

In North York another support circle discussed the screaming and hollering of their friend in the school library. Their simple solution was to take her to a rock concert where screaming and hollering was appropriate behaviour. She no longer screams in the library, but she sure bellows at rock concerts.

In Brantford, a support group found the drooling of their friend was a hindrance to his making friends. They decided, with the support of their facilitator, to stroke his arm every time he drooled. The drooling lessened.

THERE IS NO END to situations a support circle can deal with in order for the person with disabilities to enter into a full relationship with the community. It is not the student with the disability that is the focus of the support group, but the relationship of that person to others. It is the relational aspect of the student's life that is the proper domain of the support circle.

A whole set of dynamics in the lives of the members of the circle emerges. There evolves a sense of respect and trust. As circle members come to know each other, the possibility of intimacy happens, and trusted friendship comes about. The circle members become friends and some become close friends.

Comments from teenagers involved in support circles:

- Our modelling is so important. What we do, Tom does. Often, when he is bad, we have to accept some responsibility for that. He began being very hyper — just being here. But being around us has settled him right down and he doesn't need pills anymore.
- From the beginning, I didn't think that the support circle was anything for me. I was opinionated, quick tempered, and argumentative in class. So how could I teach Jane to be cool and patient and so on? Now, as a result of being in the support circle I have had to review my morals, my life, my priorities, my choices. I love her. I wish I wasn't graduating.
- Jane has taught me a lot. I realise how much I will miss her.
- I saw Jeff as just different. But now I see him as just like everyone else. I get mad at him like anybody else.
- I am a lot like Jennifer. She has taught me a lot. I have learned patience. I have become attached. I will miss her.
- When I was first accepted into another high school, it was no big deal leaving here, but now I know how much I am going to miss you guys. We should put a person like Tom in every high school. The circle is what I will miss most about this school.
- Will I ever miss Tony. He has become a real part of me.
- Jim's early behaviour was hyped. Now he has had time to relax and has really settled.
- As to proper behaviour with women, the girls are handling it beautifully. "You are not supposed to do that", they tell Jim and he stops.
- Jim's co-ordination has really improved. In soccer, he used to look at the ball and kick and miss. Now he just kicks. He even passes the ball and has picked up sharing and teamwork. We'll try to get him on the badminton and basketball teams next season.
- I see Jim in each of us. We feel the same things. My "make my day" reaction to my sister is the same as his reaction to some people who annoy him.
- I never thought about such people before. I felt sorry but never cared. Now I see Jim as a special person — what a difference. I look more at his personality, not the physical him.
- I had known Jim a little — have seen him around. I was afraid of him as he was unpredictable and I was scared. When I heard about the support circle I didn't think about getting involved. Now I understand it more. One thing — I don't take my everyday life for granted. I think of my abilities and reflect on having them and using them.

These students in the support circle come to see each other in a new and exciting way. They not only gain insights about their own selves, but have the privilege of sharing these "revelations" with others. This is a dynamic that seems to happen nowhere else in the school experience. It is this relational component that gives the members of the circle a heightened sense of dignity, value and self-worth. It frees them to be better students and citizens. The mutual relationships that develop offer unique opportunities for personal growth. Being with others in a circle of friends builds a trust of others because everyone in the group is concerned about one another. There is an evident lack of selfishness which leads to a trusting relationships that are not judgmental, suspicious, jealous, or doubting.

It is precisely here that friendship has the possibility of becoming mutual love. This in turn leads to an enormous increase in self-confidence.

IN ORDER for a support circle to function well, the members must grow together. Otherwise, the circle could disintegrate into a group of individuals who give of themselves but do not receive anything of value from each other. The personal growth of each person in the circle spins off to other networks in life. Parents have remarked how the attitudes of their son or daughter has changed since their involvement in a circle.

Support circles can be too big and likewise too small. Our experience tells us that the optimum size is somewhere between six and ten persons. This is the number that seems to promote dialogue and personal relationships. To determine the size of membership in the circle or who of the many responders should be selected, we suggest an event such as a pizza party or recreation activity that allows people to get to know each other informally. As a follow-up to such an event, the responders could be asked to express, through a poem or other artistic expression, just why the circle appeals to them.

It is essential that the person with disabilities be seen as a member of the circle and not its focus. The person with challenging needs is not the centre of the circle but very properly part of its circumference. He or she is a full member who has many gifts to bring. It is important to recall what was said previously — it is the relationships in the person's life that the circle supports. Where better to begin than in the circle itself? It is the formation of friendship with the person in the circle itself that takes priority over involvement in activities just for the sake of involvement. The developing of friendship takes time, attention and togetherness. The circle members have to determine how to work all this out.

THERE IS SOMETHING dramatic happening in schools where integration is taking place under the banner "Kids Belong Together". It is obvious that the philosophy of full integration is providing quality education and life for all students.

The recognition of the "giftedness" of every child creates a non-threatening and enriching atmosphere in the entire school community. The focus on individuals rather than labels or problems sets all kids free. This gives a sense of joy and a sense of self-worth. There is an aura of love and kids are free to learn. "Happy kids learn!" The excitement of the discovery of self leads children to want to learn more. Complete integration where "Kids Belong Together" and are supported in circles of friendship is creating a new and different school.

Notes

DR PATRICK MACKAN was founding director (and co-director with Marsha Forest and Jack Pearpoint) of the Centre for Integrated Education and Community in Toronto until his untimely death on November 23rd, 1990.

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A good source for information regarding inclusion issues is:

Network, available from the Managing Editor, Kenneth Gibbons of National Training Resource Centre, Kimberley Centre, Levin, New Zealand, Fax (64) (6)368-7131, email: Ken-g @ central.co.nz

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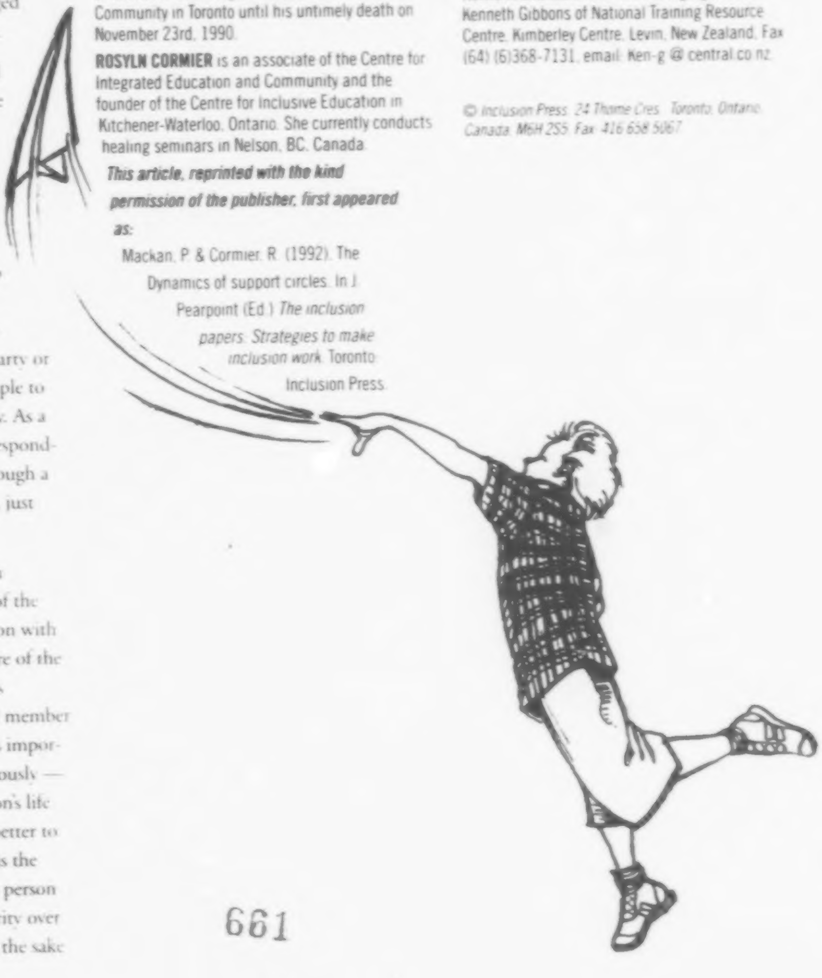

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RESEARCH INFORMATION FOR TEACHERS
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7

The Phonic DEBATE Revisited

Warwick Elley, University of Canterbury (Retired)

The recent debate in the media over the role of phonics in learning to read is but one of many such controversies, here and overseas. A recent article by Noel O'Hare in the *New Zealand Listener* highlighted some of the issues in the local debate, following a *20/20* television programme which featured Doris Ferry's phonic-based remedial methods. The August 1995 edition of Auckland's *Metro* magazine continued the controversy with a long feature article by ex-editor and ex-teacher Warwick Roger, entitled *The Phonic Boom: Adventures in the Reading Trade*. Numerous letters and articles in other magazines followed. New Zealand parents concerned about their children's reading could be forgiven for concluding that New Zealand children do not learn their letters and sounds at school, and that one child in four is failing as a result.

This reviewer would like to put the debate in a wider perspective, and to elaborate on some of the issues raised. I will use some research findings, but where they are inconclusive, will be forced to fall back on opinion. In doing so, I can only claim that I have taught, observed, and researched reading in many countries, and have changed my own position as a result of conducting such research. I hope that I am not unwilling to change again, as new evidence comes to hand.

First, we should address O'Hare's headline claim about the "staggering one child in four that gets remedial reading". Reading Recovery was established to provide a boost for children considered below-average readers in their own class. There will always be some "below average", indeed, more than one-in-four. But many of those selected for the programme are reading "relatively" well, at Book Levels 8-10. However, they are falling behind others *in their own clas* and hence are seen to need help to keep up with classmates. The fact that as many as 25 percent of six-year-olds are receiving extra help from Reading Recovery is thus no reflection on the methods used to teach them. It stems from the desire of all good teachers to do the best for their weaker readers. Certainly some are failing to learn by age six, for a whole host of reasons, but we have fewer failures than in most other countries (see below).

Secondly, the debate has been cast as a black/white controversy in the media, whereas we should be discussing the various shades of grey. It is not true to say that phonics is not taught in New Zealand schools. It is just rarely taught as an isolated exercise. It is usually taught as a word attack skill, in the context of reading meaningful text, most often in shared reading or in writing sessions. There *is* a rationale for taking this approach. It is not just "woolly, child-centred nonsense".

Arguments against having separate lessons on the systematic teaching of phonics include:

- The lack of phonetic regularity in the English language. There are so many exceptions, especially in basic words.
- The difficulty that many five-year-olds have in learning an abstract system of letter-sound links and then applying it in a diverse range of contexts.
- Young children could get the wrong messages about the real function of reading — which is to create meaning.
- When children focus on the letters and sounds (or the form of the word) their limited working memories make it impossible for them to allocate attention to the other important cues to meaning creation.
- A sounding-out emphasis in initial reading sets up slow reading habits which can inhibit fast reading later.
- Children will come to believe that the teacher will be able to teach them all they need to know, if they listen and memorise properly, whereas the task is so complex that they must frequently go well beyond what the teacher provides.
- Phonics, in isolation, is difficult for most teachers to make interesting and relevant to real reading for a lot of children at the same time. Enjoyment in reading is surely a key factor in developing the reading habit.

There is no doubt that some enthusiastic teachers, working in a *one-to-one* situation, can teach some children to overcome some of these difficulties. It is quite another matter to recommend systematic teaching of phonics as *the* general method for the thousands of five-year-olds in New Zealand and Australia, when better methods are available.

Comparative research

What of the research findings? Many researchers have attempted to clarify the relative merits of "direct phonic" or "decoding emphasis"' versus a "meaning emphasis" or "whole language" approach. The results have inevitably been clouded by differences in definition and by differences in traditions. Classrooms are messy, teachers vary their approach from day to day, programmes are not always how they are described, pupils get assistance from home, and tests are not always valid.

Some early summaries of the research from the United States (see **Notes**) showed that a decoding emphasis worked marginally better in that country, overall. However, critics argue against such a conclusion on the grounds that they used irrelevant criteria for judging success (typically word recognition) or made unfair comparisons. Reading tests used in America do tend to emphasise word recognition rather than comprehension in Grade 1. Equally important for us is the fact that the components of American reading programmes which are labelled "meaning-based" are by no means the same as those of New Zealand. Shared reading, language experience, and children able to start as five-year-olds, for instance, are all distinctively New Zealand features, or relatively new in the United States. Furthermore, recent developments in whole-language programmes, here and overseas, such as process writing, peer tutoring, listening posts, paired reading, and increasing access to quality children's literature, make these older studies less relevant today.

There are more recent summaries from the United States which have found virtually no differences in achievement levels between whole language and basal reading programmes across many studies (see **Notes**). More notable were the differences between teachers. Whole-language teaching has many facets and the commercial and administrative pressures on teachers in the United States to stay with traditional basal readers with phonics are considerable.

> The variations in pupils' home circumstances have more to do with achievement than differences in the schools' methods.

It is hard to find comparable surveys of effectiveness in New Zealand, because so few teachers use a direct phonic approach. However, there are local and international studies of some of the components of commonly used New Zealand approaches. Moreover, we can address some of the more specific issues raised by the critics of whole-language teaching.

Research on selected local methods

Shared reading is an essential component of the New Zealand version of whole-language teaching. As a method of teaching reading it has excellent support from comparative studies conducted in Niue, Fiji and Singapore. (See **Notes** for details of the studies referred to in this section.) In New Zealand, teachers who use it more often than average have children who show faster gains in reading comprehension and more positive attitudes to reading. The listening post also received strong support from this research.

Silent reading. Several empirical studies show the value of silent reading for raising achievement levels. The latest reading survey of 32 countries conducted by the International Association for the Evaluation of Educational Achievement (IEA) also confirmed that countries which devote more time to silent reading produce better results. Studies have also shown that silent reading is children's main source of new vocabulary.

Story reading aloud. Innumerable studies have shown the beneficial language effects from listening to stories read aloud. Such reading sessions allow for wide discussion and productive talk. They also initiate children into book concepts, and help them to process the decontextualised language they will encounter in typical school classes.

There is a need for more documentation of the effects of common New Zealand methods of teaching initial reading. What research there is does provide considerable support for some crucial components of our version of whole language. Furthermore, the benefits of Reading Recovery have been well documented in several countries. It too contains a number of ingredients widely adopted in New Zealand's version of whole language.

International surveys

Can international surveys of achievement throw any light on this debate? Not directly. Few countries teach purely phonics or whole language, and there are so many contaminating factors in the form of differences in resources, class sizes, orthography, cultural traditions, age of starting, and hours spent on instruction, that the IEA surveys to date have not been able to capture comparative results in a tidy form. What they do show is that the variations in pupils' home circumstances have more to do with achievement than differences in the schools' methods. Nevertheless, there are several indicators that need explaining away by the pure phonic school.

- The 1970 IEA survey showed that New Zealand 14-year-olds and 18-year-olds achieved at higher levels than any other country in reading comprehension and in literature interpretation. While these pupils had much less shared reading and language experience than children do today, the New Zealand junior schools of the 1950's and 1960's were definitely more child-centred than most, and phonics had been long discredited in the Departmental Handbooks of the day.
- The 1990 IEA survey showed that the New Zealand 14-year-olds were still the highest achievers of the English-speaking nations, but only fourth overall. However, the New Zealand samples had more English-as-Second-Language (ESOL) and main-streamed children than the other top countries. Moreover, New Zealand did produce more students in the top quartile than other countries. New Zealand 9-year-olds were sixth, but again very similar to the other top countries, several of which had suspect samples, due to the low response rate. (Schools which decline to participate tend to have more low achieving pupils.) By contrast, New Zealand had almost 100 percent response from the selected schools.

> We cannot see into the reader's mind to examine whether he/she is processing every word or letter equally.

- In the question which required students to say how they "became a good reader" a comparison of the top 20 percent of readers in each country showed that in those countries which had highest achievement, these proficient students believed that good reading required amongst other things "having lots of good books around" and "using your imagination". By contrast, the best readers in the countries where failure rates were highest believed that it was important "to sound out the words correctly" and "to have lots of practice at the hard things". Such a result is not consistent with the view that phonics is best.

- Finally, a post-hoc analysis by the author of the top and bottom 20 schools in the New Zealand sample (when the influence of home background was controlled) showed that the high-achieving schools all followed some version of a whole-language approach. All had an enthusiast for reading on the staff, all were well-stocked with quality books, and regular homework was the rule. A distinctive feature of the lowest achieving schools was a greater emphasis on phonics.

Common criticisms of whole language

Typical of the criticisms raised in the recent media debate were the following:

- Several critics point out that prediction is not an efficient strategy to teach children as studies show that words in English prose are not easily predictable. Even proficient adults can predict "the next word" successfully only 25 percent of the time.

  However, in New Zealand young children's readers are often made predictable in order to facilitate this process in the acquisition phase. Furthermore, in adult reading, the good reader narrows the alternative meanings down to a few that fit the context, and then can respond correctly with minimal cues of shape and initial letter. Much of the time we predict upcoming meanings, not precise words. Thus, this criticisms based on a misconception about prediction.

- Another point made by critics is that research on eye movement shows that skilled readers actually fixate on almost every word of text. They do not seem to predict, sample and confirm as many whole-language theorists claim.

  The implications of such a finding are unclear, however. We cannot see into the reader's mind to examine whether he/she is processing every word or letter equally. Readers may be responding only to the initial or final letters, or the overall shape of the word. Besides, children often behave differently when reading aloud, under experimental conditions, and reading silently, on their own.

- Some research shows that weaker readers are more dependent on context than good readers. The latter can identify words so quickly that it is more efficient to teach children to decode quickly from the start.

  Of course competent readers have had more practice, and have reached the stage where they are able to vary their strategy, depending on the task. If they are to read aloud accurately, they need to focus on quick decoding. Such is what the psychologists' experiments normally require. Again, silent reading may have them using other strategies. Certainly, we know that good readers' miscues are more often in line with context than poor readers' miscues, when the text is of appropriate difficulty for each group. Again, the evidence to date is not conclusive enough to challenge the value of a meaning-prediction emphasis in young readers.

> They can go from sound to sight, rather than the clumsy alternative of sight to sound.

- Recent research shows that children from the United States, Australia and the United Kingdom who have been trained as pre-schoolers in phonological awareness learn to read faster when they start school.

  It may well be possible to do this, but it may not be desirable to spend teachers' and young children's time in this way. The control groups in these studies, too, may not be learning by the kinds of methods used in New Zealand. However, this research is still in its infancy, and requires local corroboration.

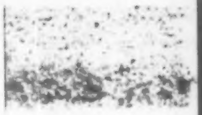
While there are other popular criticisms advanced in other countries (see **Notes**), enough has been said to illustrate that the definitive experiment is difficult to design.

Meanwhile, there are many who claim that such research is unlikely to resolve the "real" issues. Some apologists for whole language would claim that the normal criteria for evaluating progress are much too narrow. Some, for instance, deplore the limitations of standardised tests when viewed alongside the ideals of whole language — to change the relationship between teacher and learner, to empower the students, and make them lifelong readers and writers. In the circumstances they confine their arguments to logic, and to revealing case studies. Policy makers, alas, usually look for "harder" evidence, however narrow it is.

There are many other technical and philosophical issues raised by the debate. One point that this reviewer finds persuasive is that made by Doake (1987). Young children initiated into literacy with high-interest pictorial books, with predictable language, frequently develop favourite books, which they like to have repeated. They gradually learn enough of the language to be able to reconstruct it themselves. They are then at a critical stage of being able to tackle effectively the complex task of matching the sounds of the words in their heads to the visual representation on the page. They can go from sound to sight, rather than the clumsy alternative of sight to sound. As Frank Smith (1983) has said "Phonics is easy, if you already have a good idea what the word is in the first place."

In other words, a programme that immerses children in high-interest patterned print, and provides them with lots of opportunities to engage with it, and to generate their own meanings, will enable children to teach themselves the vast number of required sound-symbol links in literacy acquisition more efficiently than a systematic regime of phonics teaching. And where pupils arrive at school with limited book-experience, such a programme will provide them with the enrichment they need to "catch on", at a later stage in their development.

We can be sure of one thing — that as long as some children are failing to live up to adult expectations in learning to read, the debate will continue. To those who have spent little time observing young children learning to read the phonic approach seems so obvious. But if it were so good, the research findings would be clear-cut. They are not.



Notes

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CLASSROOM DISCIPLINE:
TEACHERS' PREFERENCES

Ramon Lewis
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Classroom management touches upon very basic notions of children and the authority of adults and social institutions. What is actually happening in classrooms?

A recent analysis of school discipline policies in all states of Australia has led one reviewer to conclude: "It is clear that government guidelines are advocating, and taking firm steps in implementing, a democratic style of leadership in schools." Most states in Australia have already abolished corporal punishment and generally encourage parent and student participation in the formulation of schools' discipline policies. The rhetoric therefore is that teachers are currently changing from autocratic and authoritarian relationships to more democratic ones.

As one who has visited approximately 50 Australian post-primary classrooms each year for the last 15 years I would argue that it is undeniable that there has been a lessening of autocratic authority structures in Australian classrooms since the second world war. However this observation is not sufficient to justify the conclusion that teachers are replacing authoritarian beliefs with democratic ones.

This paper looks at the attitudes of almost 1000 teachers towards three alternative styles of classroom discipline.

ALTERNATIVE APPROACHES TO DISCIPLINE

The range of approaches available to respond to misbehaviour vary widely from the teacher visually looking on, at one end of the continuum, with physical intervention and isolation at the other. Between these extremes are non-directive statements, questions, directive statements, modelling and reinforcement. There are three theoretical approaches to discipline, each of which is based on assumptions about how students best learn and each of which is tolerated by Western democratic traditions of schooling. One way of labelling these three styles of discipline are:

- student oriented
- teacher oriented
- group oriented.

The three approaches cover the full range of disciplinary models in schools, although of course, some school approaches comprise techniques from two or three models. The models can be readily distinguished by reference to the answers to two questions regarding disciplinary procedures. The first question is "Who is responsible for determining what expectations for behaviour will apply in schools, that is, which behaviour will be deemed appropriate and which inappropriate?" The second question asks, "Who is responsible for ensuring that students act in a way that is consistent with the expectations, once they have been determined?"

THE TEACHER-ORIENTED APPROACH

The teacher-oriented approach assumes that teachers have the right and the obligation to decide what are to be the rules for appropriate behaviour. Further, by a judicious use of recognitions and rewards for appropriate behaviour, and a hierarchy of punishments for inappropriate behaviour, teachers ensure that their expectations are met. In these types of disciplinary models power and responsibility rest with the teacher.

THE STUDENT-ORIENTED APPROACH

In contrast, there is a student-oriented alternative in which the teacher shares power fully with individual students. This approach emphasises negotiation as a means of handling misbehaviour in the classroom. It is based on an assumption that students who are disciplined by a powerful teacher will not develop self-discipline. Therefore, rather than having an obligation to force or entice students to behave appropriately the teacher has an obligation to indicate to students when their behaviour is problematic, clarify with them their view of the situation and negotiate new ways of behaving that are acceptable to both the teacher and students.

> Who is responsible for determining what expectations for behaviour will apply in schools?

The teacher can also act as a counsellor and a consultant, addressing with the students the likely consequences of their behaviour. In addition, the teacher can provide the students with the opportunity to experience the results of their inappropriate behaviour so that they can choose to modify the way they behave.

THE GROUP-ORIENTED APPROACH

The third approach to power-sharing falls between the teacher- and the student-oriented approaches. This is a group-oriented approach and assumes that students as members of a school community are responsible to that community and as essentially social beings will be willing to act in socially responsible ways to ensure group acceptance. Rather than having an individual teacher control the behaviour of all students or having each student left to negotiate his or her own mode of behaviour, the supporters of the group-oriented approach argue that power resides with the group. Consequently all rules and consequences are determined by classroom meetings at which the teacher is a group leader, with no more right to determine classroom policy than any other member of the group. Once policy is determined, however, the teacher is obliged to implement it.

The techniques which a group uses to police its members may occasionally look a lot like the procedures developed within the teacher-oriented approach. The major and vital distinction between the two however, is that the teacher-oriented approach is primarily focused on the student conforming. In that approach the use of "choice" for students to either do as they are told or be punished with a consequence, is largely a fake choice as continued misbehaviour results in more severe punishment.

In the group-oriented approach the choice is genuine and, although unpleasant consequences may follow inappropriate behaviour, the right of students to make a choice is of the utmost importance. This is because most group-oriented theorists and practitioners believe that only through genuinely free choice can students come to set limits on their own behaviour. One of the most common consequences for students who behave inappropriately is "time out", that is, being sent to a non-punitive space either in or out of the classroom, where they can reflect on their behaviour and plan for a better future. They are free to return to their class from "time out" as soon as they agree to act in a socially responsible manner.

METHODOLOGY

To assess teachers' attitudes to these three styles of classroom discipline a questionnaire was developed containing six sets of three items. For each statement (constituting an item) respondents were provided a six point response format comprising: strongly agree, agree, tend to agree, tend to disagree, disagree and strongly disagree respectively. The following nine statements are examples of those provided.

1. How should decisions be made about children's behaviour in the classroom?
   a. The teacher and not the student should generally decide.
   b. The teachers and students should generally decide together.
   c. The students and not the teachers should generally decide.
2. If two students fight over the use of a piece of equipment for school which belongs to one of them (for example a ruler) and break it, what should the ideal teacher do?
   a. Have the students decide with the teacher what should happen.
   b. Explain to the students that they shouldn't have broken it, and provide suitable punishment (for example, pay for it).
   c. Let the students decide for themselves what to do about it.
3. Which of the following is the way for an ideal teacher to help students to behave properly, other than by his or her personal example?
   a. Let the students work out their own way of behaving after they see how they affect others.
   b. Make sure they behave properly by rewarding and punishing them when it is necessary.
   c. Continually decide with the class how students should behave.

In each of the sets of three items, one alternative exemplified a teacher-oriented approach where the teacher is in total control and manipulates students' behaviour by using a combination of rewards and punishments (for example, items 1a, 2b and 3b above). The second approach, as exemplified by items 1b, 2a and 3c, assumes that the power to deal with misbehaving students is exercised by the group which comprises students and the teacher. The final approach is one which allows students to apply self-discipline, and discourages intervention by a powerful teacher or a powerful class. This approach is characterised by items 1c, 2c and 3a. In total there were six items characterising each model of discipline.

RESULTS

Analysing the data showed that classroom teachers support most an approach to classroom discipline which shares decision making between teacher and students. The teacher-oriented approach ranks a close second and very little support is provided for the idea of allowing students to independently monitor their own behaviour. Further, there is a substantial percentage of both primary and post-primary teachers who clearly support the group- and teacher-oriented approaches although they reject the student-oriented approach.

Because of the substantial variation in teachers' strength of feeling about the various approaches, the data was further analysed on three variables. These were the respondent's gender, the respondent's years of teaching experience, and the year level at which the "ideal" teacher was hypothetically teaching. It was found that the level of teacher support for the three styles of discipline varies systematically with the gender of the teacher and the year level of the class for which the issue of discipline was being considered.

Female teachers are more supportive of sharing power with students than are male teachers. This finding holds true for each scale and at every year level with one exception, the group scale at year levels 3 and 4.

This finding is consistent with other research on womens leadership styles which indicates that:

> Women's leadership styles are expressed through communication patterns which are more typical of collegial than autocratic endeavours. Women's language patterns create a consensual and participative atmosphere for decision making.

The third general result is a tendency for teachers, both male and female, to desire an increase in the concentration of power in the teacher in higher grade levels. Similarly, they show a lessening attraction for the group- and student-approaches to discipline with increasing grade level.

COMPARISON WITH OTHER STUDIES

It is interesting to compare the findings of this investigation with those of two other related studies, which indicate that teachers are less group-oriented in practice than they would ideally prefer to be.

The first, a study conducted in Melbourne reporting 710 students' perceptions of their teachers' behaviour, concludes that "teachers are overwhelmingly seen as…acting in a manner consistent with an assertive approach to classroom discipline".

The second, an analysis of almost 300 Melbourne schools' codes of conduct for students, notes that over 90 percent of the codes, which specify how discipline is to be implemented in the school, reflect teacher-oriented approaches.

Clearly there would appear to be some gap between what teachers would ideally like to utilise in schools and that which is practicable. One of the reasons for this may well be related to the findings of a survey of over 1000 parents in Melbourne that notes "parents on average strongly prefer teachers to be very much in charge".

EDUCATION VERSUS MANAGEMENT

What are the educational and managerial impacts of classroom discipline? This dichotomy is not a recent phenomenon. As early as 1914 Bagley identified a number of functions of discipline when he examined the then, current educational scene. He described the functions of discipline as, firstly "The creation and preservation of the conditions that are essential to the orderly progress of the work for which the school exists." Currently, this disciplinary perspective, described as a managerial rationale, is one within which discipline is viewed as a collection of techniques and strategies employed by teachers to facilitate order in the classroom. This order is necessary so that a learning environment is developed to maximise the learning of school subjects.

A second function of discipline can be seen as "The preparation of the pupils for effective participation in an organised adult society which while granting many liberties balances each one with a corresponding responsibility." In the 1990's this function of discipline is described as an educational function, where discipline is perceived as a learning experience via which students learn about the rights of individuals, particularly individuals who are in conflict. Consequently, an educational view of discipline perceives each approach to discipline as providing a potentially valuable educational experience.

The type of approach selected by a teacher depends on which values he or she wishes to promote in the classroom. For example, consider a teacher who would like to encourage student participation in group activities such as rule development and conflict resolution. Student participation may be seen by this teacher as providing an avenue for students to develop the knowledge, skills, values and attitudes necessary for future participation in democratic decision making. Alternatively, teachers may wish to implement a teacher-oriented approach, with limited or no student participation in decision making processes. These teachers may prefer to judiciously apply rewards and punishments in the classroom so that they may facilitate in students the development of values of conformity and obedience to legitimate authority.

Given that the majority of teachers, while providing support for both the teacher-oriented and group-oriented approaches, are more commonly likely to be implementing the former it is initially useful to reflect on the strength and weaknesses of the teacher-oriented approach.

It can be argued that the teacher-oriented approach, based as it is on behaviour modification principles, can generally be relied upon to establish order in the classroom. It is quite efficient and generally well appreciated by students, parents and teachers. Further, its use of rewards for good behaviour tends to identify it as a positive approach. The educational impact of such an approach, however, has been the focus of severe criticism. First, the approach has been criticised as emphasising irrational obedience to authority as well as limiting the development of rational problem solving.

Secondly, its emphasis on rewards has been criticised as teaching students to forgo intrinsic motivation in favour of extrinsic motivation. It is suggested that students who are rewarded excessively may come to devalue the enjoyment of achievement and learning for its own sake. Nevertheless, the argument that children should only be punished in order to encourage them to act responsibly but not rewarded to achieve the same ends is difficult to sustain rationally. For example one could hope that any student who is suspended from a school as a result of his or her misbehaviour has first experienced the full range of rewards and recognitions (as well as consequences) in a bid to see if these will keep him or her in school (and on task). It may even be necessary to keep a substantial minority of students working productively in school by "rewarding them severely".

The third major criticism of teacher-oriented approaches is that if they are not used in the context of a clearly communicated framework of moral norms it can lead to a situation where students do not readily develop self-discipline, even though they may behave in an appropriate manner. That is, the judicious use of rewards and punishments may simply promote conformity to what are someone else's rules. There may be little guilt or shame associated with inappropriate behaviour, as the responsibility for the students' behaviour may be perceived by students as resting entirely with the school administration and teaching staff.

Fourthly, and finally, teacher-oriented approaches, particularly those which emphasise, at the expense of recognition and reward, negative consequences applied to unacceptable behaviour, may alienate a minority of students who fail to derive from schools a feeling of competence, usefulness and belonging. Such students may eventually fail to respond to the application of punishments and consequently be permanently marginalised.

It is, of course, possible to argue that students who are in the habit of acting appropriately will eventually internalise the restrictions originally externally applied to their behaviour by teachers. In doing so the locus of control is assumed to transfer from the teacher, who is initially responsible for applying the rewards and punishments, to the student who ultimately becomes self regulating.

To increase the likelihood of such a transition it would be important to accompany rewards and punishments with frequent explanations and discussions with students regarding both the norms of the school community and the inappropriateness of their misbehaviour. It may also require an apology from students and some form of ritual signifying their readmittance to, or acceptance by the school community. Such techniques, which are clearly related to the development of guilt and shame in students, in a reintegrative setting, would appear to be critical to facilitating the internalisation by students of external strictures. Their usage is argued therefore to minimise the likelihood of marginalisation of miscreants and the formation of a counter culture of nonconformers within a school.

> Teachers are less group-oriented in practice than they would ideally prefer to be.

Regardless of how successful such an authoritative approach to discipline may be it could still be problematic. According to one researcher:

> If our present democratic system is not only going to survive but more importantly develop then, from the very onset of schooling, modes of behaviour and attitudes must be formed that are fundamentally democratic. Indeed, unless such practices commence in the primary sector the chances of involving young people in participatory decision making, even in such informal educational settings as the Youth Service, appear to be slight...by the time they reach their teens they have neither the skills, confidence nor experience to take power even when it is genuinely offered them.

Although it has been argued that the process of schooling does not have to be democratic in order to prepare students for a democratic society it has also been said:

> If you want people to live by social justice there is only one way to do it, and that is to initiate them into the practice of social justice. It is not done by teaching about what society might be like if you did. We only come to understand what things mean and how they work through the actual use of language discourse critique and other practice.

In summary, therefore, participation in decision making, which is central to most definitions of democracy, is argued by some to be a necessary component of children's education. It needs to be stressed, however, that according to many proponents of democratic education, although participation *per se* is necessary, it is not sufficient to guarantee democratic schooling. Groups of people have, at different times, co-operatively determined the most undemocratic of actions. What distinguishes undemocratic co-operative processes from democratic ones is that:

> Democratic decisions are determined within the bounds of the principles of non-discrimination and non-repression.

IMPLICATIONS FOR THE CLASSROOM

It is clear from the data presented earlier that if teachers are going to persist with even the most rudimentary elements of democratic education, namely, participative decision making, they will need to be sufficiently convinced of its value. Whether one focuses on a broad definition of democratic education or a more limited definition of democratic participation, it is clear that there are curriculum implications. At the very least, students and teachers would require enough substantive knowledge to convince them of the need to persist with the democratic, participative process they profess to support, in a school environment which may be at best unprepared and at worst hostile to any but an authoritative approach to classroom management.

The research noted above has implications for classroom practice, and policy formation, in the area of school discipline. With regard to the former, the research findings emphasise the counter-productive effects of a range of teacher disciplinary practices commonly exhibited in classrooms (for example, the use of group punishments, or lack of recognition of exemplary behaviour). Techniques and styles of discipline most acceptable to students, teacher and parents are also identified.

With regard to policy, the research findings highlight the need to develop a discipline policy that progressively provides more decision making for students as the ages and relevant skills of students increases. In doing so, the research brings into focus a gap that exists between parents' and secondary teachers' and to a lesser extent primary teachers' and students' expressed desire for teachers' control over students, and Governmental support for the development of self-discipline in students.

There are gender differences in the findings in that women (teachers and parents) are more supportive of power-sharing in classrooms than are men. Reflection on the results of the research described above could assist teachers to develop classroom disciplinary procedures that would minimise students' counter-productive reactions, including the likelihood that students will be distracted from their work by the teacher's actions. It may also make teachers, and the subjects they teach, better liked by students, and in addition reduce teacher stress caused by student disruption. Finally the research challenges schools to develop styles of discipline which are not only based on what works, but which are also designed to transmit culturally relevant values about the rights of people in conflict.

NOTES

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The following research questions have served as the focus for surveys of, and interviews with, students, teachers and parents, as well as analyses of schools' and governmental discipline policy statements. What disciplinary techniques are favoured by students, parents and teachers? What reasons do they give to support their preferences? What different styles of discipline do teachers exhibit and what are their effects on students? How consistent with Governmental policy is current classroom disciplinary practice and the preferences of the main players?

Full details of this study can be found in:

Lewis, R. (1994). *Classroom discipline: Preparing our students for democratic citizenship.* Paper presented to the Annual Conference of the Australian Association for Research in Education, University of Newcastle.

The analysis of Australian school discipline policies is by:

Slee, R. (1992). *Discipline in Australian public education: Changing policy and practice.* Victoria: The Australian Council for Educational Research.

The review of these policies is on page two of:

Balson, M. (1992). *Understanding classroom behaviour* (3rd Edition). Victoria: The Australian Council for Educational Research.

Research on women's leadership styles is reported on pages 43-61 of:

Robertson, H. J. (1992). Teacher development and gender enquiry. In A. Hargreaves & M.G. Fullan (Eds.), *Understanding teacher development.* London: Cassell Villiers House.

Other studies on Melbourne students' perception of their teachers' behaviour and codes of behaviour for students include:

Lewis, R. & Lovegrove, M.N. (1988). Students' views on how teachers are disciplining classrooms. In R. Slee (Ed.), *Discipline and schools: A curriculum perspective.* Melbourne: Macmillan.

Lewis, R. & Lovegrove. (1989). Parents' attitudes to classroom discipline. *Journal of Australian Studies, 25* 11-12.

Lewis, R. (1994). *Codes of conduct in schools of the future.* Melbourne: Directorate of School Education.

The functions of discipline described by Bagley are from:

Bagley, W.C. (1914). *School discipline.* New York: Macmillan.

That a teacher-oriented approach is efficient and generally well accepted by students, parents and teachers is noted in:

Lewis, R., Lovegrove, M.N. & Burman, E. (1991). Teachers's perceptions of ideal classroom disciplinary practices. In M.N. Lovegrove & R. Lewis (Eds.), *Classroom discipline.* Melbourne: Longman Cheshire.

The argument that in order for democracy to survive young children need to be involved in decision making is from:

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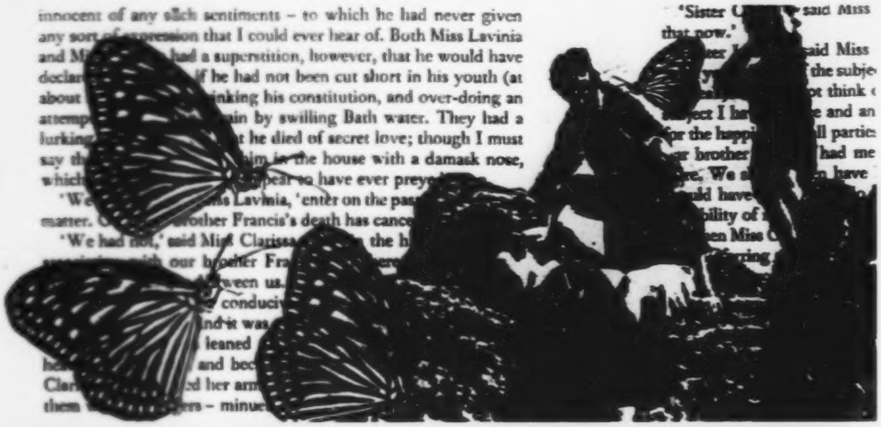
set one, 1996

NOT THE CLASS NOVEL:
A different reading program

Anne Simpson, University of South Australia



Students develop new reading strategies and a positive attitude about reading when they bond together as a community of readers. Here is an effective literature-circle program from Australia that widens secondary school students' horizons.

Individual reading choice and class study of a set novel are important features of young people's experiences of literature in school. In addition to this, however, group discussions with peers of a common novel which they choose can add an important dimension to this experience. As students themselves have said: "It's a lot easier discussing books in a small group than in a whole class. The teacher tends to do most of the talking with class novels." And "It helps you to comment on the book that you are reading, whereas if you were reading a book for personal use, unless someone else you know is reading it or has read it, you can't comment on it."

This program, used initially in an elementary school classroom and translated successfully to a high school English classroom, suggests a structure for introducing students to a wide range of new novels and can be adapted to suit many different year levels.

The value of organising small groups of students, with each group reading a different novel of their choice, is that it allows students some say in what they read. However, this freedom is within perimeters set by the teacher, who preselects the range from which they may choose. The teacher is in a position to select novels which are representative of genres the students might not normally read. Reading within a group context is a valuable support for many reluctant readers and can provide incentive to finish set chapters, particularly if the group itself sets these limits.

Small groups are also less threatening for many students who may volunteer opinions they would be reluctant to voice in front of a class. They also allow the teacher and students to engage in more intimate and personal discussion. As one student commented, "You get to know the teacher better." The reverse of this is also true for the teacher.

GETTING STARTED

Literature circles involve groups of five or six students selecting a common novel to read, reading several chapters each week, and then meeting for approximately 30-45 minutes once a week at the same time each week to discuss the section they have read. To start the program the teacher should select eight to ten novels which s/he believes will be appealing to the class yet will offer challenge and variety. Each student can be asked to nominate his or her first three choices, and then five groups are formed to read the top choices. Six to eight copies of each text are needed.

If funds are available it is an advantage to buy some recent titles, supplemented with older, less well known, novels from the bookroom. When introducing the program, the teacher can greatly increase students' enthusiasm by having new paperback copies of recent publications to choose from. Once students are off to a good start, after they recognise the advantages of the program, older and less visually appealing texts can be offered for selection. Often particular older titles that one would not expect to be popular work well in this context and gain a reputation, so that other groups are eager to read them next.

The members of each group need not remain the same for each novel, but may change, depending upon the next choice of text. As an alternative, a teacher who knows the class well might designate the groups and then let each group choose a novel.

To aid in the weekly discussion, students jot their thoughts while reading on to sticky notes — stickums — which they attach to the relevant pages of the novel. Either before or after their discussion each week the teacher may ask for a fuller 100-300 word response to the section of the novel covered. While one group is engaged in discussion with or without the teacher, the rest of the class is reading and/or writing responses.

If you didn't finish the reading, there wasn't much to talk about.

Several teachers have found they gain valuable insights into students' reading behaviour and comprehension by reviewing the students' stickums. Since students often do not get the opportunity to mention in discussion all the points they wish to make, they should attach the stickums to pages in an exercise book after they have finished that week's discussion. The teacher may request to see these books at any time, but not for evaluation or assessment — it is important that students are assured that these notes do not have to be neat, in proper sentences, or even always intelligible to others, but should simply remind them of what they were thinking as they read. If students are not given these assurances, writing stickums can become such a chore and so time consuming that they are likely to resist writing many at all, and this limits discussion in the group.

The length and nature of each of these requirements can be negotiated with the class, depending upon the year level and experience of the students. See the example of directions given to a high school English class of 14 year-olds, *Literature-circle groups: notes for students.*

THE DISCUSSIONS

Group discussions can take place either inside or outside of the classroom, depending upon the ability of the rest of the class to work without teacher supervision. Each group meets in a different lesson. Although it is possible for all the groups to meet at the same time and for the teacher to move from group to group, this does not work as well and is less popular with students. Once they get the idea of what is expected, some groups may be able operate independently for some sessions, nominating their own co-ordinator.

It is interesting to note how some students in the first few weeks quickly learn the disadvantages of not completing the set reading. Rather than sending them back to their seats to get on with reading their novel, the teacher should keep them with their group so it is clear to their peers that they haven't done the reading and are letting the group down by being unable to contribute. As one boy complained after this experience, "If you didn't finish the reading, there wasn't much to talk about." This practice also means that students with genuine difficulties completing the reading each week do not get so far behind that they get discouraged and give up. Listening to the comments of others can also inspire them to get back to the book to find out what the others were talking about.

Written responses from the previous week may be read aloud before the discussion starts, and this serves as a useful review of where the discussion ended the week before. Depending on how many students are in the group, another possibility is to nominate two different people each week to read their responses aloud.

The timetable for this program can present some difficulties, but they are not insurmountable. In a middle school classroom, literature-circle time could be the first half hour of every day. At high school the alternatives are to devote every English lesson for ten weeks to the novel, aiming for each group to cover approximately three novels, or devote the first three or four weeks each term to the program, so that everyone would complete four books over the year (one per term, where there are four terms per year).

For literature circles to be successful in terms of students' commitment to the discussions and to completion of written responses, texts are needed that deal with issues which students care about, and which raise significant social, cultural, or moral issues. Also important are texts that challenge readers in terms of style, genre, or theme, as books that are too easy or superficial do not stand up to sustained examination.

On the other hand, until students begin to realise for themselves the rewards of discussion groups and the need to read closely and write stickums and weekly reviews, the texts must not be too difficult. The teacher can gradually introduce older and more challenging novels into the program.

It is also important that students choose titles they haven't previously read, so that everyone in the group is at the same stage of the novel each week, and guesses and predictions can be made on an equal footing.

THE ROLE OF THE TEACHER

The degree to which the teacher guides or controls the discussion is a matter of individual choice, though ideally s/he should say as little as possible. Some guidelines for operating in groups are useful, so that students learn to address their remarks to each other and respond to others' comments

LITERATURE-CIRCLE GROUPS: NOTES FOR STUDENTS

PURPOSE

The main purpose of this program is to give you some choice in the novel that you read and also to give you an opportunity to talk each week with a small group of people about that book.

HOW IT WORKS

You will be with a group of five or six people who have chosen the same novel that you have. Each week — once a week in the same lesson — you will meet with your group to discuss the chapters you have read and decide how much you will read before your next meeting. You meet to talk for approximately 40 minutes with the teacher in class time.

During the time that one group is meeting with the teacher, the rest of the class will be reading their novel. If you don't manage to complete the reading in class time, you can finish it for homework.

STICKUMS

One of the most useful ways we have discovered for remembering the things you thought you would like to comment on is to make little remarks or jottings on yellow sticky labels (which we call stickums) and stick them onto the relevant page of the novel.

Write the page number on the stickum as well, so that other people in the group can find the place in the book that you are talking about quickly and easily. You should have about 10-20 stickums per session.

These notes do not have to be written neatly or in complete sentences. They are just reminders for you of what you were thinking, for example: sections or words you didn't understand, when you thought you could guess what might happen next, what made you smile, interesting/effective use of words and language, anything odd, questions you had, when you were reminded of something (another book, a person, something that happened to you, a story you heard, a film or video), how it made you feel and why, or anything else that occurs to you.

You can write these comments as you read, or go back and write them after you have finished the section, or a bit of both. It is vital that you write stickums, as they not only help keep the discussion going but also help you recognise and articulate what is going on in your head as you read.

DISCUSSION

The opportunity to talk with others who are reading the same book is an important aspect of literature circles, and although it may take a while for you all to build up skills and confidence to talk in groups, you will find it very satisfying after a while. Your questions and comments should be directed to each other, not just to the teacher. S/he is there to support you, not to direct you. S/he will participate as another member, and you should accept her/him as such.

Listening is an important part of any successful discussion. Make an effort to listen, understand, and respond to what others in your group are saying before you move on to the next point.

Don't be afraid to state the obvious. It may not be obvious to others.

WRITTEN RESPONSES

The final part of this program is the weekly response you will write and hand up to us each week. This should not be a summary of the story but rather a reflection on what you think about the novel so far. You might comment on things like (a) what you like or dislike about the story at this point and why, (b) where you think it is heading what you predict, (c) what the style reminds you of, (d) what the author is trying to achieve by including or excluding particular incidents, characters, descriptions, (e) whether there is humour and if so what kind, (f) whether you agree with the way the author is presenting the story, (g) how the author is encouraging you to feel about the different characters or the action, and (h) any surprises, anything too clichéd.

You will think of other things to talk about and write about. These are just suggestions, and you certainly do not have to try and answer them all each week. Just give your ideas, not the plot.

These weekly responses should be about one page in length (about 250 words) and handed up when you come to your discussion group. They could be drafted before the discussion and finalised afterward. They must be handed in at your next group discussion.

Your final response to the novel should be longer and reflect on the novel as a whole. You will be given some further guidance on this later.

You may read and write responses and stickums in class while another group is discussing their novel. If you have finished everything, you may read another novel of your choice.

ASSESSMENT

You will be assessed on your weekly responses, your final response, and upon your participation in the group discussions. You will not be assessed on your stickums as they are regarded as an integral part of the group discussion.

before moving on to what they want to say.

Students themselves should be invited to come up with rules for appropriate and supportive behaviour. It is recommended that the teacher take a back seat once the groups are established and only intervene when s/he feels that the group has missed an important point or gone too far off the track.

It is essential that the teacher read *all* the novels before introducing them. This makes a significant difference to students' willingness to select novels and their attitude to the program if they believe that the teacher knows what s/he is talking about. It also helps the teacher to subtly guide students' choices toward books from which s/he believes they will gain the most satisfaction.

The teacher should also make notes or stickums, both to aid the discussion if it flags and to model what is required. This is hard at first because it often means reading and noting five new texts. As time passes, however, the teacher will be able to use the same notes with a different group. Also, there will probably be only one or two new novels to read each round, so the burden lightens. There are possibilities offered here also for co-operative work with another teacher or with a teacher-librarian.

STUDENTS' VIEWS OF THE PROGRAM

The ways in which literature-circle groups meet the objectives of the program are most clearly revealed in the students' own evaluative comments.

- [This] was the first whole book that I have ever finished, but now I know that reading can be fun…it helped me with my reading 100 percent.
- I enjoy reading much more now.
- I never thought I could finish a book, but I did! It was great.
- I liked the choice which was given to us, rather than everybody having to read whether they liked it or not.
- I loved doing this program because I could choose my novel. When I am given a novel to read, I usually don't like it.
- Sometimes you read a book and later can't remember anything about it, but talking and writing and discussing a book you've read with other people helps you to think about it more and later on probably remember everything about it.
- One of the best things about meeting every week is because if a teacher asks me to read a book I just skip through and only read every few pages, but this way I have to read all the book.
- You get to read books that you probably wouldn't have thought about reading before.

CONCLUSION

Students who have been involved in this program have learnt a number of useful reading strategies and become much more positive about reading. A number read a complete book for the first time and found it to be enjoyable and rewarding. Others read different genres and took risks in selecting titles they would not have read before. They learnt the language needed to talk about texts and gained confidence in communicating their ideas to others. They began to relate one text to another and recognise that stories are constructions by authors.

> **You get to read books that you probably wouldn't have thought about reading before.**

Through the close attention to the text that writing stickums requires, students commented on aspects of style and craft, and considered alternative constructions. They were becoming skilled at noting their own responses and examining these responses in light of other readers responses. For example:

- I think when you talk about a book to others you understand more of the book yourself. It is like reading a book twice only not as boring.
- Discussion helped me bring out my feelings and beliefs.
- This is an excellent book for group discussion at school. It stimulated a lot of discussion in our group.... I feel that it may not be as interesting to a person reading it alone. For example, the ending would have left me extremely frustrated without our group work.
- It has given me more confidence because sometimes I will think something but won't say it because it seemed silly. But through these discussions I found many others thought the same things.

The teacher discovered more about the individuals in the class and influenced and supported their reading development in a way that was not possible when everyone read a different novel or the whole class read a class novel. S/he had opportunities to work on and closely monitor each individual's reading, writing, speaking, and listening skills.

One of the most exciting outcomes to witness in classes using this program is the way in which the class becomes bonded together through the novels they share. The stories themselves, the regular small-group meetings, the risks and trust that such discussions demand, and the common experiences and understandings built up through involvement in common texts lead to a strong sense of commitment among class members. They become a real community of readers in a way that reading alone or working slowly through a class novel they had no power in choosing rarely achieves.

NOTES

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10

LEARNING STYLES AND LEARNING OUTCOMES

Based on Kolb's Learning Style Inventory

Chris Perry, *Faculty of Education, Deakin University*

Learners go to school to learn, not just to learn content but also to learn how to learn. It is important for learners to know how they learn and to have knowledge of and control over their styles of learning. Those working with learners should be aware of the learner's preferred learning style, so that they can provide learning contexts where the learner is best able to learn and as well provide contexts where the learner is supported in strengthening less preferred styles. This article discusses a variety of learning styles and by describing a school-based professional development project, suggests ways teachers might go about planning for learning that acknowledges style diversity.

THE LEARNER

When we listen to people talk about the way they learn, it is clear that there are differences in learning style.

> I learn through processes…generally start at step A and work my way through.
>
> I learn by hearing things three times — like practising and watching.
>
> I learn best in a challenge situation. I only learn what I want to learn.
>
> I learn through experience and through my mistakes, through doing.
>
> I find it hard to motivate myself to learn. I've found I have to aim for a target, that target might be the final grade or result.

These reflections on what they understand came from a group of students in their second year of a teacher education course.

THE PROCESS OF LEARNING

We can think of the process of learning as a four stage cycle (see Diagram 1) — an experience is followed by observations and reflections which can lead to the learner formulating abstract concepts and generalisations which are then tested in new situations. This might then lead to new experiences.

As we develop as learners, however, our needs and goals influence this learning process so that the learning process is often erratic and uneven. Each of us adopts a personal way of proceeding through this cycle which echoes our own strengths and weaknesses — we may form concepts but fail to test their validity; we may rush into experiences but fail to reflect on the lessons to be learnt from those experiences. Thus over time and in particular learning situations we adopt preferred ways or styles of learning.

Why we adopt these preferred learning styles may be to do with:

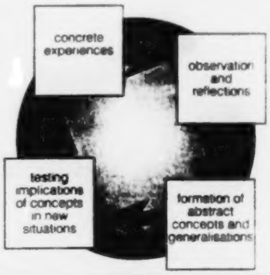
- personality — we may, for example, have reflective or impulsive personality characteristics
- our past experiences — we may have been in learning environments where we have not learned to begin solving a problem by asking what we already know about this type of task, or
- the degree of knowledge we have about how we learn — we might know that in order to remember something we would be best to write it down or repeat it several times.

KOLB'S LEARNING STYLE INVENTORY

THE LEARNING CONTEXT

The way in which we learn best is related to the context in which we do our learning. We learn *how* to learn through particular learning contexts or situations. The aim is to use a style that is appropriate to the task, situation or level of skill. Understanding the particular learning context or situation is an important step. As we mature as learners we find that we approach a learning situation in reasonably consistent ways — that is we tend to develop a particular *learning* style.

DIAGRAM 1 *THE LEARNING CYCLE*
(FROM KOLB 1976)


concrete experiences
observation and reflections
formation of abstract concepts and generalisations
testing implications of concepts in new situations

We can define learning style as:

> a relatively consistent pattern of perception, interaction with and response to stimuli in a particular learning environment, or
>
> one's preference for perceiving and processing information.

For the adult learner there are measures that can be used to describe preferred learning styles. Kolb has developed a Learning Style Inventory which is a nine item self-description questionnaire which results in a profile of a learner's preferred learning style. This inventory identifies what Kolb sees as four main learning styles or orientations. These descriptors are not intended to be discrete — attributes from one style may well be a part of another style — although it is possible that in one style a particular attribute is more emphasised.

The four learning styles and the characteristics identified as common to each are as follows:

Concrete experience mode includes a receptive, experienced-based approach to learning emphasising feeling-based judgments. Individuals learn best from being involved in real situations and prefer learning interactions with peers rather than authority figures. This is a style that functions well in unstructured situations.

Reflective observation mode includes the use of impartial and careful observation in understanding the meaning of ideas and situations. Formal learning situations, for example, lectures, are preferred as they allow the role of objective observer. These learners are good at looking at things from a variety of perspectives and appreciate different points of view.

Abstract conceptualisation mode includes an analytic, conceptual approach to learning. Impersonal learning situations which emphasise theory and systematic analysis are preferred. These learners do not benefit from "discovery learning" situations but are good at systematic planning and analysing ideas, and they value precision.

Active experimentation mode includes an active "doing" orientation toward learning, relying heavily on experimentation. These learners are good at getting things done and are able to take risks in order to achieve their objectives. They prefer to work in small groups or on individual projects.

Diagram 2 shows one individual learner's profile using Kolb's Learning Style Inventory.

This learner has a learning orientation or preference that emphasises *abstract conceptualisation* with a slightly lesser emphasis on the other three styles. It would be unusual for an adult learner to demonstrate an even preference across all styles just as it would be equally unusual for a learner to place emphasis only on one style. Teachers easily observe these situations about the learners in their classrooms.

EMPIRICAL STUDY

There has been much discussion about the validity of Kolb's Learning Style Inventory, however rather than viewing it in a diagnostic instrument, in my work with teachers I have found it most useful as a way to help teachers begin to think and talk about how they learn and what this might mean for how they plan learning experiences for their students.

I work in teacher education and am interested in how students in our courses go about their learning. I used Kolb's Learning Style Inventory with students in their second year of a Bachelor of Education program. Results from this group of students (n=34) illustrate a representation of all four styles (see Table 1).

Learners in this study clearly showed a preference for ways of learning, active experimentation being the most commonly preferred learning style. According to Kolb this closely represents the profile that would be expected for teachers.

PLANNING FOR LEARNING

Learning style can not be revealed by a single observation nor does it emerge from interaction with a single learning context. An individual's learning style preferences or repertoire emerges from multiple and long term experiences. For the teacher, it is important to recognise and encourage all learning types. It is essential that those working with learners, especially young learners, do not view one style as better or worse than another. Various styles may be more or less appropriate for various learning situations, they are not good or bad, merely different. Learning situations should be provided that help the learner develop a wide range of learning styles and as well develop the capacity to select a learning style appropriate to a particular learning context.

Consider the four learners in Diagram 3 (names have been changed).

Each places emphasis, that is shows preference for, one style over another. As well, each illustrates a preference for a different style. This diagrammatic representation of style helps us to understand why conflict may occur when learners are working on group activities for example. Without an understanding of differences in preferred styles, Amanda and Mike for example, may be heading for disaster if working together. Amanda wants to get started, to get the job going whilst Mike prefers to wait, to observe, to reflect. Conflict also could well occur if Janine and Tim were working together without an understanding of style difference. Tim feels it best to look for the rules, rely on the structure, whilst Janine feels these theoretical approaches are unhelpful and prefers to see the problem as unique where rules have to be created.

An understanding of preferred learning styles allows those working with learners to, for example, set up co-operative learning groups that encourage learners to observe others ways of learning and as well to discover that in order to complete some problems it is effective to accommodate diversity. A complex problem can be efficiently solved by having someone who can reflect on the problem, someone else who can build a general theory, another who is able to resolve the practical implications along with a fourth who can hold the group together.

If Amanda, Mike, Janine and Tim know about and understand how each other prefers to work and solve problems then activities can be planned that will take best advantaged of each style. Jobs can be shared where styles complement rather than conflict with each other.

For learners, an understanding of their learning style preferences gives them a better choice of learning activities — those activities which are likely to suit and those which are best avoided unless the learner is given help and support.

For those working with learners, an understanding of learning preferences allows for the provision of activities where an individual is best able to learn and an understanding of where an individual will most likely need assistance.

So, for good learning it is not enough to merely accommodate and support preferred learning styles. Activities should also be planned that will encourage the learner to develop more confidence and strength in less preferred styles.

A teacher could present impulsive learners with activities where they have to reflect on particular sections and take time to reach a solution. Conversely the reflective learner could be presented with activities where choice has to be made quickly, where the learner has to take a risk in offering a solution.

When activities are planned, care should be taken to include those which will require a range of abilities to reach a solution. When learners are presented with activities or problems to solve they should be encouraged to first reflect on the type of strategies needed for a resolution.

Good teachers should help students to understand how they solve problems and how they develop strategies for solving problems. As well, good teachers should encourage students to learn about the way their personality and their environment has, and is, interacting to produce the particular way they go about learning, that is their learning style.

Teachers should plan occasions where they observe which learners choose which activities, on other occasions teachers should be more directive about the learning choices — *but always let learners "in on the secret"*.

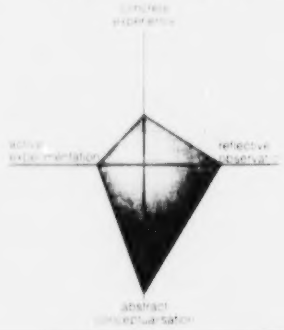
- Talk to them about the different processes.
- Ask them to discuss which they preferred and why.
- Allow them to work in the way they prefer but also ask them to try out their less preferred activities.
- Discuss the skills and strategies they may need to develop to have more success in their less preferred styles.

Teachers can use knowledge about learning style to develop programs that:

- teach about learning styles so that learners can have control over their own learning model for the learner the implications of this knowledge
- provide learners with experiences that encourage the development of a wide variety of styles
- do not disadvantage a particular learning style.

Enabling learners to understand more about how they learn gives them, and those who work with them, the opportunity to be more efficient and effective learners and teachers.

DIAGRAM 2 *EXAMPLES OF A LEARNER S PROFILE*



Using the information provided by various people who discuss learning style we can develop activities that relate to particular styles. One researcher, Gregorc, using labels different from Kolb, although describing similar styles, lists instructional preferences related to each style, see Table 2.

WORKING IN STYLE WITH LEARNING OUTCOMES

Many school systems are producing curriculum documents that describe a series of learning outcomes to be achieved by school students. In Victoria, teachers in schools are now planning their curriculum using the Curriculum and Standards Framework (CSF). The CSF encourages teachers to look at questions such as: "How do you, as a teacher, ensure that your programs really cater for the full range of students who will progress at differing rates and are likely to differ among key learning areas?" and "How do school and classroom programs allow for this reality?"

Schools have begun the process of implementing the CSF. The CSF along with Course Advice documents pay much attention to learning through the articulation of a variety of learning outcomes appropriate to particular learning levels — the *what* of learning. Auditing and reviewing the CSF and relating it to current practice has presented some concerns to teachers at the primary level. Teachers almost by definition are always eager to "operationalise", that is, see how any material that relates to curriculum development like the CSF might work in the classroom. Understanding the *how* of learning, that is, how learners process their learning — their learning styles — offers teachers a way of using the CSF learning outcomes to plan for teaching activities which accommodate and strengthen the variety of learning styles presented by those whom teachers have to teach.

As a start it is useful for teachers to reflect on the way they prefer to learn and to discuss this with other teachers. In workshops I have conducted with teachers where we have done this, teachers are often amazed to find that they as a group have a diverse array of styles. If their own peer group is so diverse this must also apply to the students they teach.

DIAGRAM 3 *LEARNING PROFILES*

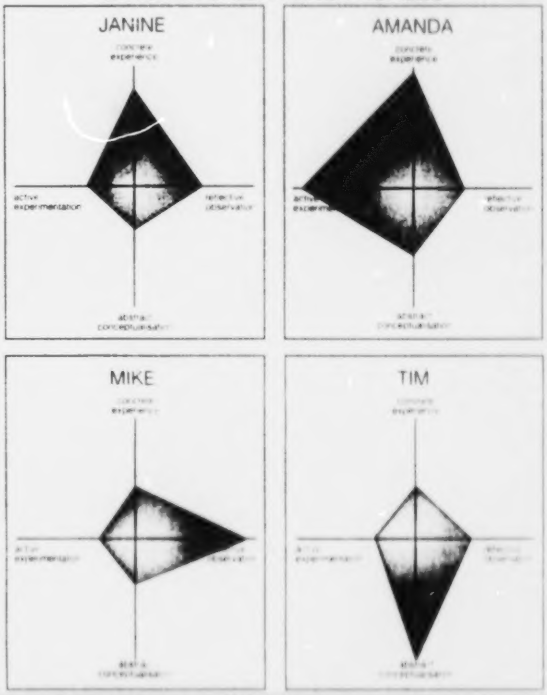


TABLE 1 *PREFERRED LEARNING STYLES*

Students' preference	*Percentage of students (N = 34)*
Concrete experience	12
Reflective observation	18
Abstract conceptualisation	22
Active experimentation	30
Students showing an equal preference for two styles	18

The teachers I have worked with show enthusiasm for trying to relate what they had discovered or confirmed about themselves as learners to the children that they were teaching. They begin to focus on differences they see in the way children in their classes are responding to the activities they are presenting to them. In discussions I have had with teachers we have explored together what the theory says about preferred style and what we as experienced teachers observed in the learners we have. Through "teachers talk" comments are made such as:

> When we looked at our kids, even in the junior grades, we could recognise some of them were displaying a dominant style preference.
>
> Knowing about style differences makes it easier to plan sessions that children will like and will respond positively to.
>
> What I think we're doing is providing four pathways so that all learners can achieve the same learning outcome.
>
> We should plan lessons so that children can experience each style and by so doing have every opportunity to learn.

An understanding of learning style preferences allows teachers to talk about the relationship between learning style and teaching style in a way they had not done before. Teachers find that they tend to teach to one or at the most two styles and as noted in research, often find it difficult to teach content from a style that is not their preferred style. The importance of recognising differences between teachers preferred styles and those of their students is a key concern.

One teacher in a group I work with remarked in a journal she keeps:

> It staggers me that for so long, and perhaps still now, this [Gregorc's abstract random style], was the most common method of instruction in our schools. One thing I wonder is — has our school gone too far the other way. The "in-thing" now is activity-based sessions which suit the concrete sequential and concrete random groups. Have we forgotten about this group? I can't think of many lessons I've planned lately for children who like to research and read for themselves. These children also like lectures. I rarely instruct children, preferring them to discover for themselves.

PRACTICAL IMPLICATIONS

Many teachers are becoming aware of style, however they are not yet incorporating style-based theory into their curriculum.

I am currently working with a group of teachers in a school where, as a university lecturer, I act as a facilitator for this school as

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part of an National Professional Development Program (NPDP) linking schools and universities. The Links (Roundtable) project involves teachers working through a model of action research for professional development at the school level. My affiliate school is undertaking aspects of professional development that relate to planning for more effective learning with a major focus on learning style.

The group decided that for one aspect of this program they would develop sets of activities that teachers could use to achieve particular learning outcomes as identified in the CSF. These activities would be written to acknowledge diversity of and development of, styles of learning. The teachers using Gregorc's titles and for example, using the Key Learning Area (KLA) of Science for the Strand *Life and Living*, substrand *Living Together*, the teachers developed four activities that would achieve the desired learning outcome. See Diagram 4.

This activity is progressing with teachers working through all the KLA's. Much discussion has occurred and significant questions have been raised about effective teaching. For example, a teacher would not necessarily present all activities in the same session. One activity might serve as an introduction and one as a conclusion. When returning to the learning outcome for revision, another approach may be used. Again, a teacher may present this session using the approach in one style but ensure that during other sessions in other teaching areas the other approaches would be covered. In the school where this project is running, the children are very much part of the discussion and sometimes after a series of sessions have been taught, they are asked to comment on how they felt about each session in terms of they way they learn. Teachers too are beginning to use style activities in planning for evaluation. Assessment items should cover all styles. A teacher might present one activity as a compulsory item and the others as choices.

TABLE 2 *LEARNER PREFERENCES BASED ON GREGORC'S STYLES*

(BUTLER 1986)

CONCRETE RANDOM
LEARNERS PREFER
- Brainstorming
- Divergent thinking
- Gathering possibilities
- Hands-on experiences
- Open-ended activities
- Webbing, mapping
- Mini-lecture
- Optional reading
- Simulation
- Games
- Experiments
- Computer games
- Forecasting
- Finding alternatives
- Problem-solving
- Investigations
- Case study
- Independent study
- Analogies
- Creating original, unusual products as a result of experimentation and divergent thinking
- Invention
- Play
- Video production
- New solutions
- Innovation

ABSTRACT RANDOM
LEARNERS PREFER
- Mapping, clustering
- Group work
- Visual thinking
- Cartoons
- Mnemonics
- Music
- Poetry
- Humour
- Short reading or lecture with discussion
- Media
- Personalised examples
- Group discussion and co-operative learning
- Guided imagery
- Role play, drama
- Interviewing
- Using metaphor
- Relational thinking
- Values clarification
- Keeping journals
- Interpretive writing or drawing
- Composing original, interpretive products
- Interview
- Poetry
- Visual arts
- Performing arts
- Creative writing
- Songwriting
- Peer counselling
- Social leadership
- Aesthetic products

CONCRETE SEQUENTIAL
LEARNERS PREFER
- Check lists
- Work sheets
- Outlines
- Charts
- Hands-on work
- Maps
- Computer programs
- Demonstrations
- Field trips
- Skills
- Memory games
- Information search
- Drill and practice
- "How to" projects
- Practical problems
- Learning packets
- Directed activity
- Diagramming
- Flow charting
- Doing timelines
- Venn diagrams
- Attribute listing
- Classification
- Realistic writing
- Making original, structured products:
  - diorama
  - model
  - timeline
  - replica
  - demonstration
  - map
  - graph
  - diagram

ABSTRACT SEQUENTIAL
LEARNERS PREFER
- Lecture
- Text
- Note taking
- Outlining
- Library work
- Documenting
- Lengthy reading
- Instructional media
- Audio tapes
- Critique
- Writing reports
- Doing research and referencing
- Doing bibliographies
- Supplemental reading
- Individualised study
- Timeline essays
- Logic puzzles
- Term papers
- Conceptualising and producing original ideas based on research
- Debate
- Theory
- Policy statement
- Formula
- Research paper
- Book
- Content mastery
- Argument

DIAGRAM 4 *ACTIVITIES FOR DIFFERENT LEARNING STYLES*

LEVEL 1 LEARNING OUTCOME:
IDENTIFY HUMAN NEEDS AND THE NEEDS OF LIVING THINGS

LEVEL 2 LEARNING OUTCOME:
DESCRIBE THE TYPES OF RELATIONSHIPS SUCH AS PARENTING, FEEDING, COMPETITION AND COLLABORATION THAT EXIST BETWEEN LIVING THINGS

ABSTRACT RANDOM
Choose a minibeast.
Create some sounds and words [tone poem] that would describe this creature. Present to class

ABSTRACT SEQUENTIAL
Choose a minibeast.
With resource material and using the skills of locating key words, list food and describe home of this creature.

CONCRETE SEQUENTIAL
Design a plan and build a model of wormery or ant farm.

CONCRETE RANDOM
Choose a minibeast. Identify and habitat. Make some suggestions as to how this creature might survive if food and habitat changed.

CONCLUSION

Teachers working in this way are now more able to approach planning for effective learning as they understand that students prefer to work in different ways. They also understand that they can plan to give learners success in their preferred styles as well as acknowledging that they should plan for teaching in a way that supports learners in their less preferred styles.

NOTES

CHRIS PERRY lectures at Deakin University in Teacher Education. She combines school-based consultancies with lecturing in the area of children's growth and development especially as it relates to the development of thinking and learning. A special focus of her research and consultancy is on the development of learners problem-solving strategies and learning style.

The definitions of learning style come from:

Pithers, R. & Mason, M. (1992). Learning style preferences: Vocational students and teachers. *Australian Education Researcher, 19(2)*, 61-71.

Jonassen, D. & Grabowski, B. (1994). *Handbook of individual differences: learning and instruction*. New Jersey: Lawrence Erlbaum.

Kolb's research into learning style and his Learning Style Inventory are described in:

Kolb, D. (1976). *Learning- style inventory: Technical manual*. Boston: McBer and Company.

There are two versions of Kolb's Learning Style Inventory. The one I have used here asks respondents to order a series of adjectives. A later version, which asks for responses to sentences, is:

Smith, D. & Kolb, D. (1986). *Learning style inventory User's Guide*. Boston: McBer and Company.

Gregorc's work on learning style is detailed in:

Butler, K. (1986). *Learning and teaching style*. Australia: Hawker Brownlow.

The *Curriculum and Standards Framework* is produced by the Directorate of School Education in Victoria. It provides advice for teachers on learning outcomes required for eight key learning areas.

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MULTI-AGE GROUPING

Alan McKay, Mangere Central School

Multi-age grouping in one shape or form is not new to Australian and New Zealand schools. A limited form of multi-age grouping can be found in composite classes, while a sole charge school presents full multi-age grouping. The reasons and purposes for creating multi-age grouping in classes are many and varied.

Alan McKay, principal of Mangere Central, a multi-cultural primary school in Auckland, gives an account of his school's transition to multi-age grouping.

TERMINOLOGY

It is not always correct to use the terms *multi-age* grouping, *vertical* grouping, and *whanau* grouping as synonymous and mutually interchangeable terms. Whanau is a Maori word with approximately the same meaning as the English word family. The word whanau and its underlying concept of "familyness" was chosen specifically for our particular form of multi-age grouping because the word whanau is recognised across the Polynesian languages of Maori, Cook Islands Maori, Tongan, Samoan and Niuean (which are the cultures with which over 90 percent of the children on our roll associate).

The concept of a whanau has deep culturally embedded values, commitments and obligations. A whanau embodies an extended family relationship of caring and sharing, of respect and tolerance, co-operation and support, in order to develop a sense of belonging and unity. Everyone has an important part to play in the whanau from the youngest to the oldest, novice to expert, naive to wisest, learner and teacher.

Children are grouped in whanau to capitalise on these cultural values, to provide culturally preferred groupings, and to provide for the culturally preferred learning styles of the participants. It is an effort to alleviate the mismatch of the values of the school with the values of the home — an effort by the school to change and become more appropriate as an environment conducive to the learner, to make the classroom reflect the relationships in a family.

In horizontal grouping children are grouped according to their age so that a class of 26 year 1 children could quite realistically all be 5 years of age. In vertical grouping children are grouped in a more natural, family type structure, with older and younger children in the same class.

REASONS FOR CHOOSING MULTI-AGE GROUPING

There are many reasons why a school may choose multi-age grouping, although of necessity, sole and two teacher schools *are* multi-age grouped. This is probably where most teachers get an insight into *peer teaching* and *children teaching children* as perfectly viable situations for learning and teaching.

As a measure of expediency in horizontally grouped schools, composite classes are often formed to even out class numbers.

The five main reasons our school chose multi-age grouping were:

- Since our school follows a *whole-language* or *natural* approach to learning, multi-age grouping can provide:
    - many varied demonstrations of language at all stages of development
    - models of language use from peers, younger learners, older learners, as well as teacher models
    - exposure to the many genre and variety of forms and functions of language in use, in a sociolinguistic environment
    - immersion in the sounds and systems of language, for real purposes
    - many opportunities for interaction, practise and demonstration of linguistic skills.
- For children from non-English speaking backgrounds multi-age grouping can provide:
    - a teacher who speaks the child's first language
    - other children who speak the child's first language
    - many native speaker models of the target language for the child to model and interact with in learning English
    - maintenance of their first language while they are learning English
    - cultural and linguistic support from teachers, other adults, peers, and other children.
- A Maori-English bilingual-bicultural multi-age whanau may provide:
    - Maori language immersion and models of the use of Te Reo Maori (the Maori language) as a living language and a language for learning
    - positive demonstrations and models of Maori values as school values
    - many opportunities to interact through the use of Te Reo Maori at the learner's stage of development, regardless of their age
    - a sense of obligation and commitment which strengthens individuals and the group
    - the climate to unite individuals into a whanau with the inherent commitments and obligations to the group.
- In a Tongan, Cook Islands, Samoan or Niuean bicultural-bilingual multi-age grouping, the children's linguistic and cultural needs can be attended to by:
    - language maintenance programmes, through interaction with a teacher or children speaking the particular language
    - cultural maintenance programmes, through instruction and assistance by a teacher or adults from that particular culture

  - heritage language learning for children born in New Zealand through exposure and interaction with native speakers of that particular language
  - English language learning through the learner's first language, in a bilingual approach.

- In multi-age grouping a mainstreamed child who is intellectually challenged can easily work at an appropriate level, quite naturally with other children in the class. This grouping provides for:
  - appropriate activities with younger peers
  - models of appropriate work habits
  - models of appropriate behaviour
  - children who are tolerant of the differences of others
  - mixing with own age group for many appropriate activities.

These reasons and purposes are diverse, but show the way in which a school, through multi-age grouping of one shape or form, can provide a perfectly viable alternative to conventional horizontal grouping, to best serve the school community and its learners.

At Mangere Central School, we chose to change to multi-age grouping because we wanted to provide the best possible learning environment for each child: a learning environment that respected the home culture, language, and values; that was culturally and linguistically appropriate: and that was designed to cater for the preferred styles of learning of each child. *Quite a challenge!*

LEARNERS

Multi-age grouping signals a commitment to have all children learning at their highest level, by providing a quality learning environment for all children. It becomes a matter of equity: to provide equal access to knowledge through a more appropriate curriculum and teaching strategies designed to suit particular children. This commitment encourages children to be active learners, to question and think critically, to reflect, and to take risks.

CHANGE

When we contemplated the change to multi-age grouping, we realised the need to consider changes to the curriculum, teaching strategies, and assessment procedures.

Through experimentation and programme assessment it was found that we had to complement the *National Curriculum* with local curriculum goals and objectives, especially in the linguistic and cultural areas. Fortunately the advent of *Tomorrow's Schools* gave us the freedom to do just that, and in fact recommended that step. We designed and developed our own curriculum, and trialled it continuously to find what was most appropriate. The most interesting and appropriate topics were developed into themes which were integrated across the curriculum and linked to children's background experiences and interests.

Teacher strategies became more learner-oriented. We wanted to know how each child learned best as an individual and in appropriately sized groups. This information guided our teaching methods and strategies. We were interested, and pleasantly surprised, to find that we were using strategies and techniques often reserved for the more able learner, with all learners. We began using thematic learning centres, involving inquiry-based activities in which learners could be actively involved as individuals, pairs, or in small groups.

We relied on guidelines such as *Bloom's Taxonomy* (see **Notes**) to ensure that activities and task cards, through the use of specific questions, covered the whole range of cognitive complexity. This provided activities that even the lowest achiever could cope with, along with activities to stimulate and challenge the highest achiever.

Peer-teaching and small-group work fostering collaborative and co-operative learning techniques were developed in all curriculum areas, and innovative approaches were used extensively to promote critical thinking.

We found that an old favourite — projects — provided us with a vehicle to combine many of the outcomes from the processes we were promoting into a systematic collection for display and publishing, keeping and treasuring. We found that we were focusing on learning how to learn, and not just merely teaching towards content acquisition.

Relevant teaching techniques and strategies were researched and trialled. The sharing of ideas and co-operative teaching strategies provided us with a repertoire of approaches which is the basis of an innovative and appropriate teaching/learning environment, able to cater for the diverse range of abilities and interests of the children in a multi-age grouping.

We considered the following strategies:

Jigsaw grouping: where grouping for co-operative tasks assists group members to become aware of the need for total co-operation for the benefit of all.

Strategic teaching: to model and promote the process of accessing prior knowledge and linking and building new learning to this.

Thinking aloud: children are grouped in pairs, a learner and a thinker. A problem is set and the thinker says aloud what is going through their mind, while the listener asks questions to help clarify what the thinker has said.

Reflective journal writing: learners are provided with a specific time each day to reflect on what they have learned that particular day.

Reflecting on home learning: to link the school learning with home learning the learners are asked to note down what they learned at home that night, or weekend.

Connecting triangle: a strategy of linking what the class is studying, to personal experience, and to what is happening nationally or internationally.

Mapping: a connection making strategy relating ideas, concepts, and words to prepare a story, charts or project.

Problem-oriented pre-reading: before a problem is presented, the learner is provided with some specific reading task which will assist in formulating an answer to the problem.

Connection making: linking school learning, with home learning, and a child's view of their world, based on their prior experiences and learning.

Observational problem solving: to broaden learners' understanding of the many ways problems can be solved, as they observe others solving new or similar problems and comment on the process used.

Open ended problem solving: questions to allow the learner to access prior knowledge, and to approach a problem from a new angle, for example: "How would the troll tell the story of *The Three Billy Goats Gruff?*"

Reciprocal teaching: a small-group interactive dialogue which centres around the strategies of questioning, summarising, clarifying, and predicting.

Problem solving at home: when the learners are involved by parents in the active decision making and problems solving in real life situations.

(See **Notes** for sources of teaching techniques and appropriate strategies).

Teachers at Mangere Central have become inventive, innovative, co-operative, collaborative, and more open to taking risks in their planning and teaching. The main recipients of the enthusiasm and upskilling were of course the learners. They became involved in planning, helping them focus on the purpose for learning as they were called upon more and more to take an active part in their own learning.

ASSESSMENT

When it came to assessment we had to carefully consider the issues. We were involved in processes, not just end points and results. Weekly, monthly or half-yearly standardised tests were clearly inappropriate. We began developing a portfolio system for collecting data upon which we could base our assessments of each child's development, individually and cumulatively. Data, in the form of work samples, is chosen by both the teacher and the child, so that the learner becomes a participant in the assessment rather than just the object of it. We aim to provide a comprehensive and cumulative picture of each learner's development, contextualised within each learning situation. This includes such things as: running records, conferencing data, interest inventories, observations, samples of work, interview notes, and error analysis.

Another area that is becoming more and more significant is that of metacognition — the learner's knowledge of the reading or writing process and strategies, and himself or herself as a reader, writer, and learner. To do this we need information about the child, by the child, in the form of: self reports, questionnaires, interviews, conferences, group discussions, and peer revelations.

Hopefully children will begin to use these strategies more and more in their own learning as they work out what they know about learning, and begin to make connections between new learning and prior,learning, and in-school and out-of school learning.

INCLUSION

At all times the concept of inclusion has been promoted. All children are acknowledged for their contributions leading to success, progress, and achievement, during whanau assemblies, and whole school assemblies. As we have a diverse ethnic population we consciously and deliberately incorporate the different cultures and languages of our children into all aspects of school life. A great emphasis is put on the effort shown by the learner, and the amount of participation and involvement demonstrated in a wide range of abilities and activities. Intelligence and academic ability are nurtured along with social skills, aspirations, loyalty and good citizenship; tolerance, empathy, and sensitivity towards others, whether they differ through ethnicity, gender, religion or impairment, are highly valued attributes of the learner, along with the academic.

In attempting to maximise diversity by promoting inclusion, we believe that a child who spends each day with other children who vary in age, gender, ability, interests, backgrounds, ethnicity, culture, and language will have a far richer learning experience.

PLANNING FOR CHANGE

Obviously change takes time and for successful multi-age grouping to become accepted and acceptable, a time frame for its inception must be proposed and adhered to. A long-term plan is necessary to ensure that the transition takes place successfully and that each step is fully evaluated to ensure realistic and appropriate progress. The school plan must include such stages or steps to:

- disseminate knowledge about multi-age grouping
- explore models evident in other schools similar in make up
- investigate proposed visits to observe in schools with operating organisations similar to that proposed
- devise appropriate, and obtain available, resources
- project a timetable for school development for the implementation and phasing in of multi-age grouping
- engage a facilitator to ensure an objective but supportive transition.

TEACHERS

Principals, as leaders and innovators, are the key to change but the instruments of any change must be the teachers themselves. The relationship between the teachers and the principal is critical to the whole idea. Teachers may have to challenge, or be challenged on, their beliefs about learning, knowledge, and what they perceive to be education.

Principals have to guide and nurture teachers, provide them with professional development opportunities, assist them with resources, and demonstrate appropriate teaching/learning strategies. They must be able to assess when each teacher is ready for the next step by careful monitoring and provide support and encouragement as needed. The appraisal cycle must take into account the amount of change that is taking place as teachers come to terms with their new challenges whilst needing to remain inventive, innovative risk takers. The appraisal needs to be geared towards progress made, teacher development needed, and the actual personal development taken place within the parameters of the school development plan. To take risks they need to know they are being supported, and that they can share their successes and failures with each other.

PARENTS

Parents, as stakeholders, need to be involved at the very earliest stage. By publicising the idea well in advance, inviting parents to attend meetings to explain the new envisaged organisation, and being open and honest about the reasons and purposes for the change, parents are being involved in the decision making.

TRANSITION

It may be trite to quote that "Rome wasn't built in a day" but as far as multi-age grouping is concerned it is an absolute truism. Since making a change to full multi-age grouping involves the entire school culture, curriculum, teaching strategies, and assessment procedures, a school would have to approach the transition in clearly defined stages.

Variables to consider include:

- teacher readiness
- type, purpose, form of transition
- parent responses
- Board of Trustees stance
- staff concerns
- availability of resources
- curriculum status
- professional development.

Schools need to consider two important factors:

- Where they are at this given point in time.
- Where they are planning to be in the future.

This applies to schools who are contemplating a shift to multi-age grouping, as well as those who have made tentative steps in this direction, and to schools who believe they are models of multi-age grouping. There is no end point, only a continuum.

MAKING THE CHANGE TO MULTI-AGE GROUPING

From 1996 New Zealand schools will be dispensing with the old labels of primers and standards. This leads the way for schools wishing to take the first step towards multi-age grouping. Schools now have a convenient indicator of a child's chronological progress through school, their time at school in terms of school experience: year 1 will signify their first year at school, year 2 their second year and so on.

This is purely an indicator, or a form of classification. The next stage is to change the designation of the junior (primer) or senior (standards) playgrounds or areas of the school. Encourage the junior class teachers to be accepted in the senior parts of the school (duty and sports) and vice versa. Combine a few classes to begin with (for example year 1 and 2, year 5 and 6) and gradually add a new year to each class each year. Work towards junior vertical groups of year 1, 2, 3 and senior vertical groups of year 4, 5, 6 children by the third and fourth years of change.

I would recommend that this remain the ideal for the fourth and fifth years to allow teachers to come to terms with curriculum, teaching strategies, and assessment changes, and offer some respite from the ever increasing demands of curriculum change, by providing some stability over two years. Once teachers become secure and confident with a senior vertical group, or junior vertical group, it's a good time to refocus on the reasons, purposes and rationale for:

- whole language
- children from non-English speaking backgrounds
- bilingual education
- language and culture maintenance
- mainstreaming.

Often schools are organised into whanau or syndicates which can develop multi-age grouping within a given time frame, as schools within schools, providing an example of what is possible and giving a lead with the objective of the whole school being involved in multi-age grouping. It is then important to go back to their purposes and reasons for multi-age grouping to reassess the situation. Multi-age grouping in an advanced stage is the culmination of a lot of hard work, dedication and commitment. The rewards are tangible and intangible. What I see are children who are tolerant and co-operative. Talented children who are able to learn at their own level, in their own language, proud of who they are and what they are in terms of their culture and language. Independent and aware of their own learning abilities, motivated to achieve at a high level, but prepared to collaborate and co-operate with their peers, and prepared to pass on their knowledge and expertise to their peers. Thoughtful, critical and appreciative of what the school as a whole has to offer, but above all valued as learners and teachers, and confident members of a school society.

Multi-age grouping is an answer to a challenge. A challenge of equity and multicultural education. A challenge to gender, racism, ethnicity and mainstreaming. A challenge to education in the future.

While in Wisconsin, USA in 1994, attending conferences for teachers, I came upon this story which epitomises to me in a few words what I think we are basically trying to do. Allow me to share it with you.

> An old man was walking along the beach one evening at low tide. He noticed that thousands of starfish had been stranded in the sand by the receding waters. In the course of his walk he came upon a young man who was picking up some of the starfish and throwing them back into the sea.
>
> "What are you doing?" the old man asked.
>
> "Oh, just saving some starfish," the young man replied.
>
> "Well you're a fool," the old man told him.
>
> "Really?" replied the young man. "What makes you say so?"
>
> "Well, just look at all the starfish on this beach. There are thousands of them." The old man looked around and then at the young man. "You don't have the time nor the energy to save all of them. Your saving a few starfish is nice, but in the larger scheme of things it's ridiculous. What difference could you possibly make?"
>
> The young man looked at the old man for a moment. Then, wordlessly, he bent down, picked up a starfish, and threw it far out into the water.
>
> "Well," he said, putting his hands on his hips in satisfaction. "I made a big difference to that one."
>
> —Anonymous

Isn't this what we are trying to do? *Make a difference!*

NOTES

ALAN MCKAY is Principal of Mangere Central School, New Zealand.

Details of Bloom's Taxonomy can be found in:

Bloom, B. (1956). *Taxonomy of educational objectives* (1 and 2). USA: Longmans.

Bloom's Taxonomy of Cognitive Processes is a comprehensive and valuable guide to assist in devising questions and activities which challenge and extend children at increasingly complex levels of processing, for example: knowledge, comprehension, application, analysis, synthesis, and evaluation.

That peer-teaching and small group work fosters collaborative and co-operative learning is from:

Reid, J. (1989). *Small group learning in the classroom.* Rozelle, NSW: Chalkface Press, Primary English Teaching Association.

The importance of projects is expounded by:

Ward, G. (1988). *I've got a project on...* Rozelle, NSW: Primary English Teaching Association.

The teaching techniques and strategies used at Mangere Central were drawn from the following:

Anstey, M. Integrating writing and inquiry. *PEN 66.* NSW: Primary English Teaching Association.

Aronson, E. (1975 February). The jigsaw route to learning and living. *Psychology Today.*

Bell, G. & McCowan, J. (1992). Learning difficulties and classroom support. *PEN 89.* NSW: Primary English Teaching Association.

Corson, D. (1992). Teaching in a multi-ethnic school. **set**: *Research Information for Teachers, 2,* 8.

Kelly, M. & Moore, D. (1993). 'I've found my memory!': Reciprocal teaching in a primary school. **set**: *Research Information for Teachers, 2,* 8.

Limbrick, L., McNaughton, S. & Cameron, M. (1985). Peer tutoring. **set**: *Research Information for Teachers, 2,* 12.

McCowan, J. & Bell, G. (1992). Learning difficulties and classroom support. *PEN 89.* NSW: Primary English Teaching Association.

Morris, J. (1990). Story maps for story structure. *PEN 75.* NSW: Primary English Teaching Association.

Nuthall, G. & Alton-Lee, A. (1994). How pupils learn. **set**: *Research Information for Teachers, 2,* 2.

Perry, C. (1994). Thinking about thinking. **set**: *Research Information for Teachers, 1,* 14.

Rowe, H. (1989). Teach learning strategies. **set**: *Research Information for Teachers, 1,* 14.

Rowe, H. (1994). Critical thinking. **set**: *Research Information for Teachers, 1,* 15.

Smith, R.M. & Associates. (1990). *Learning to learn across the life span.* San Francisco, USA: Jossey Bass.

Swan, S. (1995). Thinking books. *PEN 101.* Primary English Teaching Association.

Yates, G. & Chandler, M. (1994). Prior knowledge. **set**: *Research Information for Teachers, 2,* 6.

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Co-operative Small Groups in Mathematics: The Perceptions and Involvement of Intermediate Students

Catherine M. Mulryan, St Patrick's College, Ireland

Co-operative small-group instruction is an instructional mode which has been receiving increasing attention in the United States and in parts of Europe in recent times. Co-operative small-group instruction, which involves students collaborating together in small groups on learning tasks, is being perceived as an effective means of promoting learning, especially learning which involves higher-order thinking. Experimental studies have indicated that the use of co-operative small groups can result in positive cognitive and non-cognitive outcomes for students, including improved achievement and race relations and interpersonal relations.

Although research evidence shows that co-operative small group work can provide important and enriching learning opportunities for students, these positive outcomes are not automatic. The co-operative small-group setting differs from other instructional settings in a number of ways, and teachers need to bear this in mind when using this instructional format. For example, norms for student behaviour in the co-operative small-group setting differ considerably from those in other learning settings, especially the whole-class setting. Therefore, if students are to benefit from working in co-operative small groups they must adapt their behaviour and level of engagement to the demands of this setting. For such adaptation to occur students must recognise that behaviour needs to be adjusted and they must have the skills to make this adjustment. Teachers cannot assume that students know how to co-operate or that requiring them to work in co-operative groups will automatically result in such learning. Students need to be trained to co-operate or collaborate on group tasks.

The co-operative small-group setting also differs from other instructional settings, especially the whole-class setting, in that it involves greater uncertainty and unpredictability for students. This factor is likely to affect the learning of at least some students, especially low achievers. In the whole-class learning setting teachers' expectations tend to be more varied for low than for high achievers, as a consequence of their attempts to improve low achievers' performance. This is likely to lead to greater uncertainty among these students about behaviour and, consequently, to greater dependence on their teacher. Also, since low-achieving students are usually accustomed to a more structured learning environment than high-achieving students in the general classroom setting, their learning is more likely to be negatively affected in the co-operative small-group setting.

In small groups students are likely to compare themselves with other students, at least in relation to mathematics competency, and this comparison process can influence students' behaviour in groups. For example, students who perceive themselves as less competent than their peers will be less willing to participate actively in group work. Students who perceive that they are more competent than other group members may be more motivated to work on tasks. Some students may exert less effort in groups because they do not perceive themselves as personally accountable for the group product, and they consider that their individual contribution is not easily identifiable by the teacher. Another possible reason why some students may be less active participants in co-operative small groups is that they may regard their efforts on group tasks as dispensable and, therefore, may withdraw effort from these tasks. This is more likely to happen in the case of low-achieving students. Withdrawal of effort may be further encouraged by more competent students who communicate, either implicitly or explicitly, to low-achievers, that their efforts are indeed dispensable.

If students are to benefit from their involvement in co-operative small-group instruction, teachers must take into account the above factors and prepare students adequately by training them in co-operative learning skills. The work of Elizabeth Cohen (1986) and others provide useful guidelines in this area.

PURPOSE AND NATURE OF THE STUDY

The study described here examines the difference between high and low achievers (aged 11-13 years) in their response to the demands and opportunities of co-operative small-group instruction. Gender differences were also explored. Student behaviour and perceptions were investigated through observation and interview.

> All students did not benefit in the same way from increased involvement during small-group work. High achievers engaged in significantly more high-level, on-task behaviour than did low achievers in co-operative small groups.

The study was conducted in three schools in a school district in a small Midwestern city in the United States. Five sixth-grade classes and one fifth-grade class were chosen for the study. In the chosen classes students worked in co-operative small groups for mathematics at least once a week. The students were middle to upper middle-class, and the majority were white and from English-speaking homes.

Teachers were asked to rank students in their math classes according to mathematics achievement and the degree to which students co-operated and worked well in small groups. Eight target students in each class were chosen for observation based on these rankings. Two students, a boy and a girl, were chosen from each of the following categories:

- the top third on the mathematics ranking and the top third on the co-operation ranking
- the top third in mathematics and the bottom third on co-operation
- the bottom third in mathematics and the top third on co-operation
- and the bottom third in mathematics and the bottom third on co-operation.

Student behaviour was observed in co-operative small-group mathematics, whole-class mathematics, and reading-group settings. Comparisons were made across settings. In the study I looked for differences between whole-class and co-operative small-group settings on the following variables:

- the amount and type of students' time on-task for all students as well as for high versus low achievers and for girls versus boys
- the frequency of different kinds of participating behaviour for all students as well as for high versus low achievers and girls versus boys.

The type and nature of student attending behaviour (that is, time on-task) were examined. Three types of on-task or attending behaviour were discriminated:

- on-task engrossed (the student is absorbed and occupied on the approved task in such a way that attention is fully engaged and thoughts are deeply occupied on this task)
- on-task at work but not engrossed, and
- minimally on-task (the student is scarcely and superficially engaged in learning tasks or activities either individually or with others).

I conducted taped individual interviews with teachers and students. The interviews were intended to provide some insight into the way in which students and teachers perceive aspects of the co-operative small-group instructional setting and the differences and overlaps between them in this regard. The interviews were also used to examine the way in which both groups actively tried to make sense of their experience and the way in which they interpreted the perceptions and behaviour of one another. Student and teacher perceptions were related to student behaviour in co-operative small groups.

FINDINGS

STUDENT INVOLVEMENT

Students manifested more time-on-task in the co-operative small-group setting than in the whole-class mathematics and reading-group settings. This finding is similar to the finding in previous research that students are more active during small-group co-operative work than in other instructional settings. However, in the present study, all students did not benefit in the same way from increased involvement during small-group work. High achievers engaged in significantly more high-level, on-task behaviour than did low achievers in co-operative small groups. High achievers spent five percent of their time in co-operative small groups off-task; low achievers were off-task 13 percent of the time.

High achievers interacted more with their peers in co-operative small groups than did low achievers. Differences in interactive behaviour, however, reached significance only in the case of suggestion and direction giving; high achievers provided significantly more suggestion and directions than did low achievers. On the other hand, low achievers asked more questions than high achievers did in co-operative small groups. This finding is consistent with other research findings which indicate that question asking in co-operative small groups is associated with low achievement.

Although I obtained few gender differences, those that were found may have important implications for practice. Previous studies have revealed that students who ask questions in co-operative small groups are more likely to lack understanding and have less information about the task than students who make errors. In my study, the fact that girls asked significantly more questions than boys may indicate that some girls had more problems with, or perceived themselves as having more problems with co-operative learning tasks. Research findings which indicate that some girls tend to be less independent than boys in mathematics and that the co-operative small-group setting provided them with an environment in which they can depend on others seems to have some support from my findings.

That low achievers tend to be less actively involved than high achievers in small groups is an important finding. At least some of the factors mentioned above may have contributed to the relative passivity of some low achievers. For example, the unpredictability of the small-group setting compared to the whole-class setting for low achievers may have contributed to the less involved behaviour of low achievers during group work. In addition, the fact that teachers tend to have more varied expectations for low achievers in the whole-class setting may have resulted in uncertainty about teachers' and peers' expectations for low achievers in co-operative groups.

Other factors that may have contributed to low achievers showing less involved behaviour than high achievers in co-operative small groups are negative self-efficacy feelings and negative social comparison resulting from a history of repeated failure on mathematics tasks in the whole-class context.

Findings showed that students often used each other as resources, asking questions and checking information. Although the frequency of question asking in small groups was relatively low, most questions were asked by low achievers, mainly low-achieving girls, and more information-giving behaviour was manifested by high achievers than by low achievers. The roles of "helper" and "helped" that emerged in many small groups may not have been useful, especially when the same students consistently played these roles. In such circumstances a "caste" system can develop that discourages the "helped" from active initiation or information-giving behaviour in small groups. That such a caste system may already have existed in the classes in this study may explain some of the behaviours observed, especially the relative passivity of low achievers. Some students reacted negatively to low achievers' questions, especially if these questions were frequent.

If instruction in co-operative work methods had been given by teachers in this study, more students, particularly low achievers, may have been more actively involved and might have co-operated more fully on task.

PERCEPTIONS OF STUDENTS AND TEACHERS

There was general agreement between students and teachers regarding the purpose and benefits of co-operative small-group instruction in mathematics and appropriate student behaviour in this learning setting. The themes of collaboration and sharing, student-student help and support, and opportunity for social interaction and active participation were prominent in the responses of both teachers and students. The social dimension, however, was emphasised more by students than by teachers, and task variables were emphasised more by teachers.

Co-operative learning tasks that involved the use of manipulatives were those most preferred by students. Those tasks were also cited by most teachers as having worked best during the study in terms of promoting and facilitating good co-operative involvement among students. Teachers were concerned that mathematical co-operative learning tasks should provide students with challenging learning opportunities and have a strong emphasis on problem solving and exploration. Connectedness with regular curriculum was deemed to be important by most teachers. Co-operative learning tasks, according to teachers, should also be motivating and enjoyable for students.

In stating what they considered to be the characteristics of an effectively working co-operative small group, the students gave primary place to social considerations. A good co-operative group was generally perceived to be one in which students liked each other, shared and helped each other, and completed the work. Teachers placed more emphasis on curriculum and task variables and on the thinking processes that students engaged in. Group organisation and procedure, task involvement, and understanding of mathematics content were mentioned by teachers, but not by students.

Teachers and students both agreed that group accountability existed in the co-operative small-group setting in mathematics. However, whereas all teachers agreed that individual accountability also existed in their classrooms, students believed that it did not. There was general agreement between students and teachers, however, in relation to ideal co-operative small-group size and relation to the stability of small-group membership. Most teachers and students were in favour of relatively frequent changing of co-operative small-group membership.

High achievers interacted more with their peers in co-operative small groups than did low achievers.

Study findings showed some differences between student and teacher perceptions. For example, high-achieving students were more concerned than low achievers with getting correct solutions to co-operative learning tasks. Help giving was mentioned more by high achievers than by low achievers, and high achievers also mentioned more characteristics of effective co-operative small groups than did low-achieving students. Overall, high achievers emerged as having a more complex understanding of co-operative small-group work than did low achievers. Differences between girls and boys in their interview responses were minimal, although the girls emphasised social variables over academic ones more than the boys did.

Some differences in perception existed between teachers. The most notable difference concerned expectations for student behaviour in co-operative small groups. Some teachers mainly emphasised the opportunities that co-operative small-group work would provide for extended and novel ways of thinking and approaching mathematical content, whereas other teachers placed most emphasis on classroom management issues, including group organisation and task completion.

CONCLUSIONS

Study findings indicates that most students responded well to the challenge of co-operative small-group work. However, some students appeared to have difficulty in adapting to the demands and opportunities of this learning setting. For example, many low achievers were relatively uninvolved or passive in co-operative small-group work. Some girls, especially low-achieving girls, may also be losing out during co-operative small-group work.

The study also provides some interesting insights into the way in which students and teachers understand the setting in which they work and the differences and overlaps between them in this regard. It shows the extent to which both groups actively try to make sense of their experience and the way in which they interpret the perceptions and behaviour of one another.

Teachers and students together paint a rich picture of co-operative small-group work. Generally, the co-operative small-group setting is perceived as one in which students undertake a task or set of tasks collaboratively, giving and receiving help, ideas, opinions, and information that can aid the group in completing the task. The co-operative small-group setting also provides students with opportunities to engage in higher-order thinking and problem solving in a way that is often not possible in regular mathematics lessons.

Although there were some differences in the emphasis and in the substance of responses among students and teachers and between students and teachers in relation to aspects of co-operative small-group instruction, there was a larger area in which perceptions, understandings, and expectations were shared.

Teachers who use co-operative small-group instruction need to become aware of individual students' patterns of responding in small groups and take steps to promote more active involvement by all students, and especially low achievers, in groups.

NOTES

CATHERINE M. MULRYAN, now at St. Patrick's College of Education, Drumcondra, Dublin 9, Ireland, completed this research as part of her doctoral thesis in 1989 from the University of Missouri, Columbia. This study was funded in part by the National Science Foundation (grant NSF/MDR 8550619).

Further details and results from this study are reported in:

Mulryan, C. (1989). *A study of intermediate students' involvement and participation in co-operative small groups in mathematics.* Unpublished doctoral dissertation, University of Missouri, Columbia.

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Mulryan, C.M. (1994). Perceptions of intermediate students' cooperative small-group work in mathematics. *Journal of Educational Research, 87*(5), 280-291.

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The value of co-operative small-group instruction for mathematics teaching is discussed in:

Noddings, N. (1989). Theoretical and practical concerns about small groups in mathematics. *Elementary School Journal, 89*(5), 607-623.

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Studies showing positive outcomes for students in co-operative small groups include:

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Schmuck, R.A., & Schmuck, P.A. (1983). *Group processes in the classroom* (3rd ed.). Dubuque, IA: Brown.

Sharan, S., & Sharan, Y. (1976). *Small-group teaching.* Englewood Cliffs, NJ: Educational Technology Publications.

Slavin, R.E. (1983). *Cooperative learning.* New York: Longman.

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That the requirements of co-operative norms and behaviour differ from other instructional settings is from:

Cohen, E.G., Lotan, R.A., & Leechor, C. (1989). Can classrooms learn? *Sociology of Education, 62,* 75-94.

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Janke, R. (1978). *The Teams-Games Tounlamen: (TGT) method and the behavioral adjustment and academic achievement of emotionally impaired adolescents.* Paper presented at the annual meeting of the American Educational Research Association, Toronto.

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Slavin, R.E. (1980). Effects of student teams and peer tutoring on academic achievement and time-on-task. *Journal of Experimental Education, 46,* 252-257.

Ziegler, S. (1981). The effectiveness of cooperative learning teams for increasing cross-ethnic friendship: Additional evidence. *Human Organization, 40,* 264-268.

Studies regarding the amount of understanding held by students who ask questions in co-operative small groups are documented in:

Webb, N. (1982). Group composition, group interaction, and achievement in cooperative small groups. *Journal of Educational Psychology, 74*(4), 475-484.

The suggestion that girls tend to be less independent that boys in mathematics is from:

Phoneme, E., & Peterson, P. (1987). Effective teaching for boys and girls: The same or different? In D.C. Berliner & B.V. Rosenshine (Eds.), *Talks to teachers: A festschrift for N. L. Gage* (pp. 111-125). New York: Random House.

That instruction in co-operative work methods can be useful is recommended by:

Corno, L., & Mandinach, E.B. (1983). The role of cognitive engagement in classroom learning and motivation. *Educational Psychologist, 18,* 88-108.

Studies of small group activity are reported in:

Good, T.L., Reys, B., Grouws, D.A., & Mulryan, C.M. (1989). Using workgroups in mathematics in an attempt to improve students' understanding and social skills. *Educational Leadership, 47,* 56-62.

King, L. (1989). *Student classroom perceptions and cooperative learning in small groups* (Tech. Rep. No. 475). Columbia, MO: University of Missouri, Center for Research in Social Behavior.

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Webb, N.M. (1985). Student interaction and learning in small groups: A research summary. In R. Slavin, S. Sharan, S. Kagan, R.H. Lazarowitz, C. Webb, & R. Schmuck (Eds.), *Learning to cooperate, cooperating to learn* (pp. 147-172). New York: Plenum Press.

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set one, 1996

Is there a case for INTEGRATED LEARNING SYSTEMS?

Jean D.M.Underwood, *School of Education, Leicester University*

In the school year 1993-94 a team from Leicester University evaluated a six month trial of one Integrated Learning System (ILS) in nine schools in the United Kingdom. The evaluators worked with children from eight to thirteen years of age.

The evaluation design was based on the comparison of outcome performance in mathematics (basic numeracy) and reading for designated experimental and control groups in five schools, although additional data from all nine schools enriched this central core of data.

There were significant learning gains in the ILS treatment group for mathematics (basic numeracy) compared to the control group. However, no such gains were recorded for reading, pupils performed equally well whether working with the ILS or in the classroom.

The following summary defines the concept of ILS, outlines the key findings of our evaluation and speculates on the key role of teachers in the effective use of such systems.

WHAT IS AN INTEGRATED LEARNING SYSTEM?

The term Integrated Learning System (ILS) is an ill-defined and often misused term. It derives from the United States and is held to mean a computer system that includes extensive courseware plus management software usually running on a networked system. There are three essential components to such a system:

- the curriculum content (see Figure 1)
- the record system (see Figure 2)
- the management system.

Much of the subject specific software in the United Kingdom, and elsewhere, incorporates the first two components: that is a range of tutorial materials and assessment modules linked to a student record system. One dividing line between an ILS and many of these tutoring packages is that of scale. An ILS will have substantial course content and aggregated learner records.

A more fundamental difference between such packages, however, is the management system of the ILS. The functionality of the management system may vary but, at a basic level, it will update students' records, interpret learner responses to the task in hand and provide performance feedback to the learner and the teacher. These data collected and interpreted by the system may also be used to provide an "individualised" pathway through the curriculum content. This ability of the system to provide a "differentiated" programme of work for individual children has proved to be a very important feature of learning experience. The degree to which the locus of control over individual learning sequences lies with the machine, the teacher, or the learner is a key difference between the various systems now on the market and provides a demarcation line.

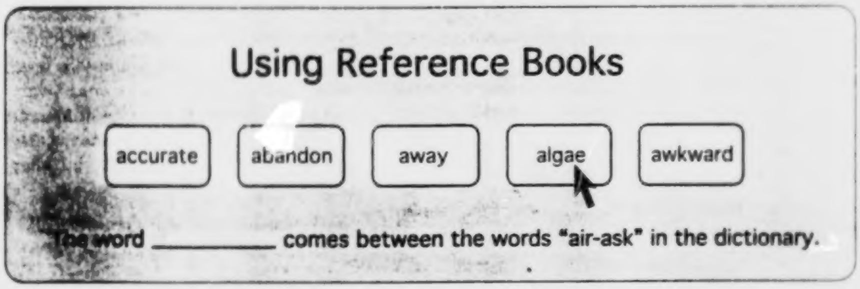
THE CONTEXT OF THE EVALUATION

One outcome of the 1993 visit by members of the Department for Education (DfE) and the National Council for Educational Technology (NCET) to the United States was an increased interest in ILSs. Such systems have been in use in the United States for a number of years and there is some evidence that they are an effective learning mode, although the findings do need to be viewed with care. Indeed as the interest in the United Kingdom has risen there has been a similar rise in disaffection with such systems in the United States.

In the spring and summer terms of 1994 NCET conducted a national trial of two software packages in twelve schools. The purpose of the trial was to assess whether the use of ILSs would prove to be an appropriate and effective approach to learning in a British context. These trials have now been extended for a further year and similar trials are now being conducted in the Australian state of Victoria.

The key question for the formal evaluation was: "Could the use of an ILS enhance children's acquisition of basic skills in numeracy and literacy?" The summative evaluation of learning gains was conducted by the team at Leicester University. This report is based on the first six month evaluation trial of one of those ILSs, Computer Curriculum Corporation's (CCC) *SuccessMaker — version 15*. As I write the data from the follow-up evaluation is being processed and will be publicly available early in 1996.

FIGURE 1 *A TYPICAL LANGUAGE EXERCISE FROM* READER'S WORKSHOP



Using Reference Books

The word __________ comes between the words "air-ask" in the dictionary.

The child selects his or her answer by clicking on the appropriate word, in this case algae

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SuccessMaker is not the only ILS on the market, and indeed it may not be the most effective. Information on the effectiveness of such systems, other than that supplied by the producing companies, is very hard to find although one available review does fill a number of gaps (see **Notes**).

MORE ABOUT THE TARGET SOFTWARE

CCC *SuccessMaker*, the software at the heart of this evaluation, is generally viewed as a closed system, that is the curriculum content and the learning sequences are not designed to be changed or added to by either the tutor or the learner, although later versions of the package are predicted to be more open. This closed structure does not mean that all learners will take the same pathway through the material. The management system, within the bounds of pre-set algorithms, will produce a differentiated teaching sequence for each learner based on his or her previous and current performances.

Figure 1 presents a typical language activity from the second language model. A typical screen from *SuccessMaker* although well designed and, when viewed in colour, moderately visually exciting, nevertheless does not look significantly different from a large number of pieces of "drill and thrill" or more often "drill and bore" software written in the early 1980s. The fact that there are hundreds and maybe thousands of such screens in the mathematics and language packages does not immediately lift the heart.

What is of more interest, however, is the reporting system which feeds into the management system. Figure 2 shows one of the 60 or so reports that a teacher can retrieve from the system. Here we see one girl's progress in mathematics and language skills. It is these data that the system uses to assess a child's progress and to plan the next phase of work. In this case Susan (not her real name) is performing well on addition (AD = 100 percent correct) but less well on measurement (ME = 85 percent). Her Reader's Workshop report shows that her performance on vocabulary tasks is good (Voc: 82) but she is a little less successful on comprehension tasks (Comp:78). In her next session she will find that the focus of the work has shifted to her areas of weakness. Adjustments level of work to ensure that the child achieves some measure of success is in the hands of the teacher.

In addition to this feedback on performance to both child and teacher, the latter may also call up a report on the strand under review by the system. These are again the areas of work that have been assessed as weak and which the "system" will target in the next lesson for that particular child. Homework, set by the system, will also target such weaknesses.

OUTCOMES OF THE EVALUATION

The evaluation team supplemented pre- and post-tests, which measured numeracy and reading skills, by observing the whole class and individual pupils as they worked both in their classroom and on the ILS. Class teachers' comments on selected students' attendance, effort and achievement were also valuable additions to our evidence.

Full details of the formal evaluation can be found in our report (see **Notes**). The key points are, however, that children working on the Computer Curriculum Corporations's *SuccessMaker* ILS performed significantly better in mathematics than children working in the control groups. Taking the control group's progress as a baseline for six months' growth, the CCC's *SuccessMaker* ILS mathematics group made the equivalent of up to 20 months growth in that six months' period. This finding concurs with the Computer Curriculum Corporation's own studies and with other evaluations of a second commercial system.

There was no discernible difference between the ILS and control reading groups. Review of the evidence from schools in the United States would suggest that a small effect might be found over a full year. The lack of any finding over a six month period is therefore not surprising. The question of the effectiveness of the CCC's *SuccessMaker* ILS for language development remains open.

In terms of behaviour there are some preliminary indications that good work practices are being transferred from the ILS classroom to the standard classroom.

WHAT DID THE CHILDREN SAY ABOUT THE ILS?

Children expressed a strong preference for mathematics and language work with the system rather than in the classroom. English which many children equated with writing was not well liked, but across all the schools in the trial, drama received a very positive rating. Teachers of English and drama might take heart that not all aspects of their subject were viewed unfavourably.

When talking about the ILS itself, over 50 percent of the interviewees made positive comments about the games format, the reward system, and the rapid feedback they received. Approximately 40 percent of the interviewees commented on the advantages of having a personalised system that was non-punishing and excluded their peers. They enjoyed working at their own pace, in a calm working atmosphere, with a ready helper (the machine) to hand. As the children expressed it — this was a case of having your own personal teacher who did not wander off and help others when you were in need!

On the negative side children were strongly disaffected by the American nature of the CCC *SuccessMaker* material. One girl wrote a short essay to the evaluator detailing her frustration at the use of words like "mom" and "cookie". The strength of feeling here should not be ignored.

WHAT DID THE TEACHERS SAY ABOUT THE ILS?

An overwhelming majority of the teachers, at every stage of the project, offered positive comments on the ILS experience. One teacher wrote "An excellent resource used alongside other teaching methods", and another "I feel it is a good teaching aid and well worth keeping".

Where negative comments were made these were usually expressed in the context of overall satisfaction. For example, one respondent wrote "Firstly, I am very happy with it.... There are however a huge number of concerns and things we need to develop and organise."

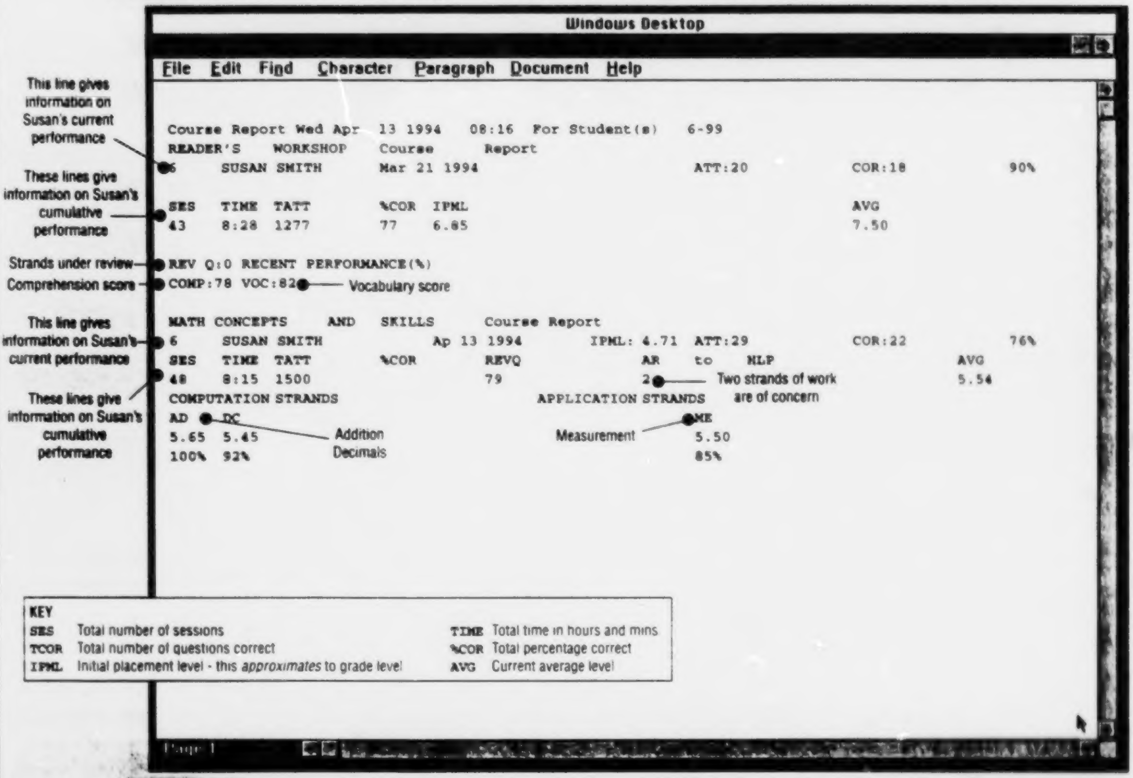
The vocabulary used to describe their reaction to ILS ranged from "excellent", through "enthusiastic" to a rare "disappointed". The bulk of responses contained only positive comments, though a minority also contained caveats of one kind or another. Positive comments recorded were very enthusiastic, such as:

> An excellent diagnostic tool. It saves an immense amount of time in finding areas of weakness in a detailed manner. A great motivator as it offers the pupil control... Excellent for a solid grounding in basic skills.

Primary school teachers felt that all abilities seemed to have benefited, not just the lower ability children, and except for one or two comments concerning problems of concentration, the primary respondents believed that gains had been made throughout the ability range.

Some secondary teachers believed that all pupils had made progress, while others suggested that it was the high ability (and to a lesser extent the middle ability) children who had most benefited from the ILS experience. Several of the teachers noted that the lower

FIGURE 2: *PART OF SUSAN'S (STUDENT 6) COURSE REPORT FOR* READER'S WORKSHOP *AND FOR* MATH CONCEPTS


Windows Desktop
File Edit Find Character Paragraph Document Help
This line gives information on Susan's current performance
These lines give information on Susan's cumulative performance
Strands under review
Comprehension score
Vocabulary score
This line gives information on Susan's current performance
These lines give information on Susan's cumulative performance
Two strands of work are of concern
Addition
Decimals
Measurement
Page 1

```
Course Report Wed Apr  13 1994   08:16  For Student(s)   6-99
READER'S   WORKSHOP   Course     Report
6     SUSAN SMITH     Mar 21 1994                      ATT:20          COR:18          90%

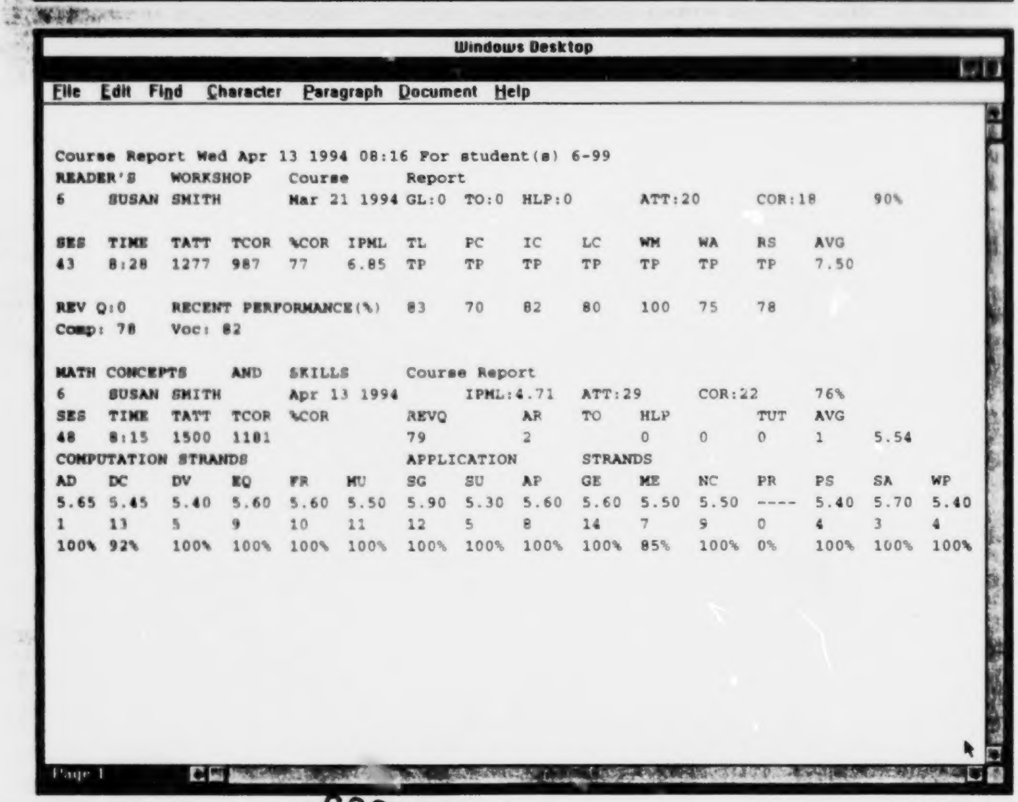
SES   TIME  TATT        %COR  IPML                                     AVG
43    8:28  1277        77    6.85                                     7.50

REV Q:0 RECENT PERFORMANCE(%)
COMP:78 VOC:82

MATH CONCEPTS    AND   SKILLS     Course Report
6     SUSAN SMITH           Ap 13 1994      IPML: 4.71  ATT:29          COR:22          76%
SES   TIME  TATT        %COR        REVQ            AR    to    HLP                AVG
48    8:15  1500                    79              2                              5.54
COMPUTATION STRANDS                           APPLICATION STRANDS
AD    DC                                                   ME
5.65  5.45                                                 5.50
100%  92%                                                  85%
```

KEY

SES	Total number of sessions	TIME	Total time in hours and mins
TCOR	Total number of questions correct	%COR	Total percentage correct
IPML	Initial placement level - this *approximates* to grade level	AVG	Current average level


Windows Desktop
File Edit Find Character Paragraph Document Help
Page 1

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Course Report Wed Apr 13 1994 08:16 For student(s) 6-99
READER'S   WORKSHOP   Course     Report
6    SUSAN SMITH      Mar 21 1994 GL:0  TO:0  HLP:0      ATT:20      COR:18      90%

SES  TIME  TATT  TCOR  %COR  IPML  TL    PC    IC    LC    WM    WA    RS    AVG
43   8:28  1277  987   77    6.85  TP    TP    TP    TP    TP    TP    TP    7.50

REV Q:0    RECENT PERFORMANCE(%)   83    70    82    80    100   75    78
Comp: 78   Voc: 82

MATH CONCEPTS    AND   SKILLS      Course Report
6    SUSAN SMITH      Apr 13 1994       IPML:4.71  ATT:29      COR:22      76%
SES  TIME  TATT  TCOR  %COR        REVQ        AR    TO    HLP         TUT   AVG
48   8:15  1500  1181              79          2           0     0     0     1     5.54
COMPUTATION STRANDS                APPLICATION       STRANDS
AD   DC    DV    EQ    FR    MU    SG    SU    AP    GE    ME    NC    PR    PS    SA    WP
5.65 5.45  5.40  5.60  5.60  5.50  5.90  5.30  5.60  5.60  5.50  5.50  ----  5.40  5.70  5.40
1    13    5     9     10    11    12    5     8     14    7     9     0     4     3     4
100% 92%   100%  100%  100%  100%  100%  100%  100%  100%  85%   100%  0%    100%  100%  100%
```

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ability students became demotivated and could not maintain concentration on the system for very long. This was argued to be the result of too long on the system each session, or too long for a lower ability student to remain on the same module. This reinforced the comment of one teacher that care should be taken to ensure that students are placed at the right level in the initial stages. One wrote that s/he had received requests from lower ability students to come off the system. Another argued that: "The statemented children would all benefit more effectively from less time [that is, shorter time span at each session] spent in the ILS room." In the second phase of the project, which is now nearing completion, teachers have been encouraged to adapt the system to their pupils' needs.

[Note: Statemented children are those who have been officially assessed as having learning difficulties of a serious nature. These difficulties may be socially or psychologically based. Schools receive additional resources to support statemented children.]

"MY PRACTICE HAS CHANGED"

Now is perhaps a good point to reflect on the impact of ILS on the teachers themselves. Towards the end of the first phase and certainly in the second phase of the project, teachers have become more comfortable with the system and are asking key questions about how it should be used in conjunction with other teaching and learning techniques and schools are developing models of practice to integrate ILS fully into their working day. The more innovative and advanced thinking, of necessity, is coming from those teachers who have been working with the system for two years. This is to be expected as it takes time to gain any real understanding of such a complex product.

The impact on classroom practice does not follow a simple pattern within or across the schools. For some teachers it is a refocusing of work in the classroom to support or complement the ILS. For example, one teacher decided she needed a renewed emphasis on comprehension as the system was repeatedly showing that this was the language skill her pupils had most difficulty with. A second teacher refocused her classwork on practical and investigative mathematics as these were the weak points shown by the ILS.

Other teachers have seen the ILS not in learning terms, but as having a direct impact on themselves as tutors, supporting or modifying their own evaluations of children's development: reminding them of skills and exercises which have not been used for some time — "in that sense it is a refresher course for me as a teacher"; or, as noted by a recently qualified teacher, supporting pedagogic skills that the teacher recognises as a personal weakness.

We are then, in the second phase of the project, beginning to see constructive moves by teachers to use the ILS effectively. The first stage of this is to understand the system, and the second stage is to actively use that knowledge to integrate the ILS experience into a whole curriculum. This is best summed up by one primary teacher, who argues that:

> It does matter how you use the ILS. It is not a delivery system but a partner with the children and the teacher in the learning process. You must think of a partnership if you are going to get the full benefit from the system.

IN CONCLUSION

Many people are uncomfortable with the concept of ILS — it certainly does not produce a curriculum with an investigative problem-solving focus. This discomfort has been noted:

> The majority of parents do not want their children to learn by sitting at a screen all day long. Most normal adult behaviour is interactive — and you get some strange people if they've been up in the attic staring at a computer screen from the age of 5 to 16.

This should not be an issue for ILS. The evaluation team found that approximately half an hour a day was the optimal time on the system. More lengthy stays at the machine lead to reduced motivation and poor behaviour.

The credibility of ILSs is also being strongly questioned in the United States not just by theorists who argue that this is a poor model of learning, but also by school boards who have not seen the promised eradication of poor numeracy and literacy skills. In the latter case the schools' administrators have often operated a "teacher deficit model of education" based on the assumption that the children's failure to learn is caused by lack of teacher expertise.

The negative feedback from the United States contrasts sharply with our study. We believe that there are a number of key differences in between ILS usage in the United Kingdom and the United States. One such difference is the British perception that ILS delivers a significant but limited part of the curriculum. It is not the total solution. A second is that many of our teachers have made a conscious effort to come to a fuller understanding of the system and, through that understanding, have started to integrate the ILS into their practice. They do not see the introduction of ILS as teacher replacement — rather they are looking at a new and effective tool in the teacher's armoury.

The preliminary Phase One study produced exciting results. We need now to see whether Phase Two of our evaluation, which is again funded by NCET under the auspices of the DfE, confirms these initial findings.

NOTES

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More information may be found on:

WWW:http://indigo.stile.le.ac.uk/~edu/STILE/jdu.html

The research on which this article is based is fully reported in:

Underwood, J., Cavendish, S., Dowling, S., Fogelman, K., & Lawson, T. (1994). *Integrated Learning Systems in UK Schools*. Coventry: NCET.

Evaluations and a review of the effectiveness of various ILSs can be found in:

Becker, H.J. (1992). Computer-based ILSs in the elementary and middle grades: A critical review and synthesis of evaluation reports. *Journal of Educational Computing Research, 8*(1), 1-42.

The definition of ILS is from:

Office of Technology Assessment. (1988). *Power on! New tools for teaching and learning*. Washington D.C.: US Government Printing Office.

That a curriculum should be problem orientated is advocated by:

Underwood, J. & Underwood, G. (1990). *Computers and learning: Helping children acquire thinking skills*. Oxford: Blackwells.

The quote that parents are concerned about children learning from computers is from page 11 of:

Picardie, J. (1995, April 2nd). Have traditional schools had their day? *The Independent on Sunday Review*.

That ILS are poor learning models is argued by:

Pea, R. (1993). Practices of distributed intelligence and designs for education. In G. Salomon (ed.) *Distributed cognitions*. New York: Cambridge University Press.

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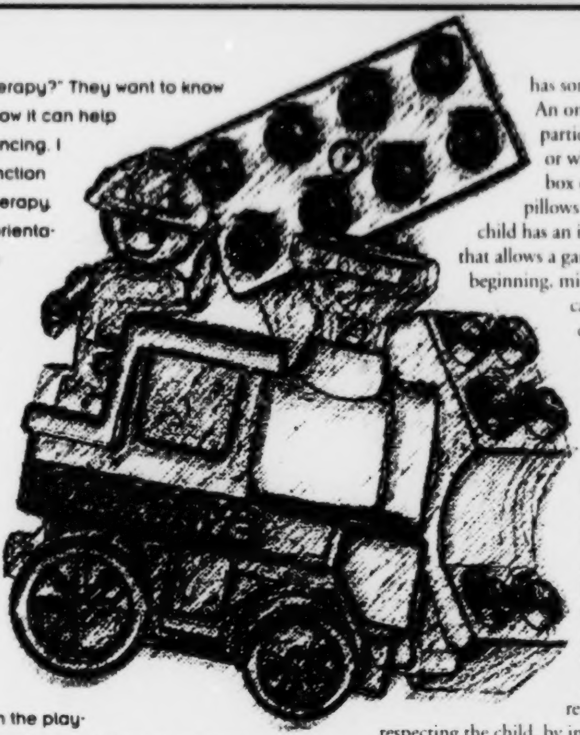
PLAY AS HEALING

Dorothy G. Singer, Yale University

Parents often ask, "What is play therapy?" They want to know how play can lead to growth and how it can help ease the pain their child is experiencing. I think it is important to make a distinction between "just playing" and play therapy. The therapist adopts a particular orientation or strategy that may include a variety of treatment approaches, depending on the nature of the child's disturbance, temperament, and age. But irrespective of any particular approach, the play therapist's goal is to help children gain a positive self-concept, master conflicts and anxieties, and develop competence in dealing with incidents that they may never truly experience within the playroom. A child, for example, may be terrified of the dark and have trouble falling asleep. This exact situation obviously will not occur in the playroom, but through play therapy the child will learn how to cope with fears in general; eventually he or she will conquer that fear at home.



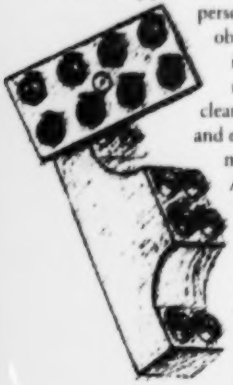
Some children who come to my playroom do not know how to play and seem to have difficulty using their imagination. They have missed the delight and fun of play or what is sometimes referred to as the *flow*. This flow occurs when action and awareness merge, enabling children to become less self-conscious and less aware of their own body states. These children, the nonplayers, will be guided by me, step by step, as I interact with them, first, in simple play and then by gradually introducing more materials or ideas for make-believe games. I tread slowly and carefully, allowing the child (if he or she wishes or can) to take the lead, to initially choose the materials or games preferred. Subtly, I try to shape the child's behaviour to become more constructive, or more restricted if the play is aggressive and wild, but always attempting to give the child a sense of control, accomplishment, and "joyous abandon".

Children use symbolism when they play. Through internal representations of reality, a child seeks to imitate and accommodate complex adult actions and speech. Gradually, externally generated material is reshaped and assimilated in novel ways into the child's existing memory schemas. When this occurs, games become more elaborate and complex. Children develop scripts so that pretend play has some order and meaning for them. An onlooker may wonder what a particular block construction signifies, or why dolls are placed in a cardboard box or in a "cave" made out of pillows and an upturned chair. The child has an image or plan in mind, a story that allows a game to be sustained with a beginning, middle, and ending. Through careful observation of a child's play configurations, and through listening to a child's conversations, I am able to make interpretations about his or her emotional state.

My approach is eclectic but based on humanist play therapy, a model developed by Carl Rogers and adapted by Virginia Axline and Clark Moustakis, pioneers in the field of play therapy. Within this tradition, my goal is to create a play environment that is positively reinforcing. I do this by responding empathically, by respecting the child, by interacting with the child through words and play, by setting clear, realistic limits, and by building trust between the child and myself. Trust develops by accepting the child as he or she is. I try not to be impatient or to hurry a child. If there is a need for silence, that is supported. If there is a need to repeat a pretend game, that is also accepted, allowing the child to work through feelings as the game is played many times. I listen carefully and encourage a child to express feelings. I reflect on those feelings. Through this process, children begin to gain insight into their behaviour. I try to be flexible. Within the humanist therapy model, I use a variety of techniques:

- *Traditional play techniques*: doll's house, dress-up clothes, puppets, water play, arts and crafts materials, blocks, miniature figures, cars, trucks, board games, and music.
- *Modelling behaviour through role playing*: the child and I take turns becoming a sibling, parent, or teacher, for example, thus enabling the child to imitate more appropriate responses in conflict situations.
- *Imagery techniques*: a child is encouraged, without the use of props, to picture people and events and to experience moods, conflicts, and resolutions in the mind.
- *Behaviour modification*: a child's positive behaviours are reinforced through external rewards such as a star and a sticker, leading ultimately to self-reward or intrinsic satisfaction.

Parents play a vital role in the play therapy process. They attend a monthly session with me, where I share my concerns about the child, listen to their concerns and make recommendations that will hopefully alter child-rearing patterns that may not have been beneficial. The school, whether a pre-school or an elementary school, is another facet in the mending process. Meetings with school personnel and observations of the child in the classroom are necessary to gain a clearer picture of the social and emotional development of each client. Also, I meet regularly with a small group of other psychologists who specialise in working with young children. We present our cases, and share ideas about new assessment and treatment methods.



The playroom

There are certain basic elements that I believe are necessary in a playroom. Space, of course, is important so that a child will not feel confined. However, a room that is too large may make a child feel lost and distant from the therapist. I am fortunate to have two areas that can be separated by a wooden blind. This allows a smaller, cozy room that provides security for some children; alternatively, the blind can be raised, affording a larger space if I want to work with groups. There is a carpeted area for quiet activities or for play that may be a bit more rough. Part of the room has tile on the floor, good for water or paint spills, or for riding a small vehicle or running miniature-car races. There is a bathroom adjoining the playroom, essential when working with young children. It was a crucial element in working with Robert, a child I will discuss who had a toilet phobia.

Equipment should be simple. I have a work table and chairs for board games, arts and crafts, and writing stories. There is also a small table and chairs for tea parties, birthday parties, and playing restaurant, or shops. I also have a couch in the room in case a child wants to play bed time or just cuddle with a soft toy. There is also a comfortable armchair for a child to sit in and relax whenever I use imagery techniques. A small slide in one corner of the room also has a boxlike place under the platform. This makes a good "house" for dolls, a "cave" for pirates, or even a hiding place for a small child. A boy I worked with years ago used this "nest" for retreat whenever he needed to have a quiet moment to think. Generally, he crawled into this space after he had exploded in rage. Here he would recover, come out, and feel "new" again.

Some therapists believe that a playroom should be relatively bare so that the child will be forced to interact more with the therapist than with the toys. In my experience, if there is a variety of toys, a child will find something he or she likes; then, using that choice, the therapist has the opportunity to engage the child. Most children (especially pre-schoolers) do not readily verbalise their problems, but as they play and become more relaxed, the therapist finds a way to root out what may be causing the child emotional pain.

There is always ample opportunity during sessions for a child to just talk and not play. And this does happen. Sometimes a child bonds very quickly and feels trusting enough, or has enough insight about a particular problem, or is so concerned about a fear that verbalisation needs little prompting on my part. Some children need to work with their hands, and as they draw or construct an object, they become more relaxed, more willing to share a burden.

Case 1

Bereavement: the use of traditional play materials

(All names of clients and their families in the following accounts have been changed to preserve confidentiality).

The first case I present utilised a traditional play therapy approach but incorporated modified Rogerian principles. I permitted the child (referred to here as Lois) to choose her toys and games. As she played, I responded with empathy both to the feelings expressed and to the actions she initiated with the toys. I also did some role playing to help her modify her interactions with her father. Through Lois's symbolic play and use of her imagination, I was able to see her worries unfold. Play was also restorative for her. As she gained strength and saw other possibilities for herself, despair began to fade, and Lois became more optimistic about her future.

Lois's mother was dying of cancer. This eight-year-old child needed to work through her feelings about her impending loss and the adjustment she would have to make after her mother's death. Her parents were divorced. Her father had remarried and would have legal custody of Lois on her mother's death. This caused her mother tremendous distress. On occasion, Lois visited her father's home in a different state and spent long periods during holidays and summer vacations with him and his new family. My goals were to help Lois accept, as best she could, the knowledge that her mother was dying and that she would be uprooted from school, from her home, and from her friends. Lois was caught between two parents who had experienced a miserable marriage and an ugly divorce, and who now barely communicated with each other. They were in continual struggle over decisions concerning the legal and physical custody of Lois.

When Lois came for therapy, she was resistant to the process, maintaining distance through the use of word games and puzzles. She invented "secret codes" that she offered to me to decipher. Her defences were intellectual; she engaged me in these games, trying to decide whether or not she could trust me. Denial was another defence that Lois used, insisting that "Mommy was okay" and that she, Lois, would "never, never live with Daddy". I was working against time; it wasn't clear how long her mother would have to live.

Lois was serious, quiet, and distant during our first encounters. In order to impress me, Lois brought me her school test papers so that I would admire her perfect scores. This was Lois's way of making contact with me on an intellectual level. She carefully avoided any questions I asked about her family and insisted that we "stick to our puzzles". She showed great pleasure when she beat me in a word game.

Me: You like to win.
Lois: Yes, I sure do. I feel awful whenever I lose a game.
Me: Why?
Lois: I don't know — it's like I'm no good or dumb.
Me: Do you think you always have to win?
Lois: Well, no, but losing is bad or scary.
Me: Scary?
Lois: Yes. Don't lose anything, that's my rule!
Me: Grownups lose games, and even very smart people lose games. We can't always win.
Lois: Well, you have to — that's all.
Me: Why?
Lois: I don't know. Anyway, I don't want to talk about this!

Lois was afraid of loss — loss of her mother, loss of her security. It was important for her to hold tightly to whatever she had, and games were symbols for her family. However, after a month of our word games and puzzle play, Lois felt more comfortable with me and began to explore the playroom. She took the doctor's kit from the cabinet and began to play with a small bear, examining it as she played doctor.

Lois: I don't like to be sick, and I don't want anyone to be sick.
Me: Who's sick, Lois?
Lois: No one — let's play house.

Lois did play house during our next sessions. She cuddled the dolls and the bear and fed them, play-acting "mother", but when I attempted to comment on this tenderness, Lois retreated and made it clear that she did not want to talk about her mother. Her play was focused on dealing with the mothering that she so sorely needed and feared that she would lose. At about this time, approximately two months after therapy had begun, her mother's condition worsened considerably, and Lois's play reflected this situation. Lois began to build what looked like a closed box.

> *Me:* You're making something, I see.
>
> *Lois:* It's a tower. I'm playing princess. Here she is inside. There are no windows, no doors. No one can come in. No one can go out.
>
> *Me:* It seems like that princess wants to be alone.
>
> *Lois:* Yes, she's safe here. She's protected. This is a palace all around here. Here is a mother, a father, one brother, a husband, a maid. People can come into the palace — but only four at a time.
>
> *Me:* The princess never leaves the tower.
>
> *Lois:* No, never. She needs to stay in there always.
>
> *Me:* Always is a long time. When will she come out?
>
> *Lois:* She might go out, but in disguise — maybe on a picnic. Everyone is in the palace. All the people are there to protect her, to keep her safe. She is afraid to go out.

The princess in the tower was Lois's game throughout the next month. Her play symbolised her fear of being alone after her mother's death. What Lois could not tell me in words directly, she told me through this game. Lois saw herself surrounded by people she loved but isolated from them in her tower. Her play theme was one of security and protection. Only in her tower, where there were no windows, no doors, was she safe. She did not have to cope with her mother's death or be separated from her. Lois played this game while her mother fought valiantly to recover.

A few sessions later, as our relationship developed, Lois seemed ready to accept some suggestions that I had made. Perhaps the princess could open a window and look out. Perhaps she could visit a family in the doll's house, where it was safe, and see if she liked it there. Lois sucked her thumb, came over to me and sat on my lap, and seemed to be giving these ideas some thought. She looked at me and didn't reply, but I felt that she had recognised what she was doing in her princess game. She became very quiet and then told me that we could play house. She went to the tower and removed some blocks, leaving an opening for a door and windows, but the princess doll remained inside. Over the next few sessions, the princess doll "watched" as Lois played with a favourite doll, a "momma doll" who tenderly fed her babies and tucked them into their beds. We began to make some progress: the princess could look out the window; the door was open, and Lois played family. Her thoughts were slowly turning toward her new family. Her father had two children with his second wife, and this would be Lois's new home. The fear of being alone and abandoned had lessened. Lois wanted a loving mother and security. She began to think about her father's new family as hers, but she still had not truly accepted this situation. To do so signified the final end of her mother. In Lois's mind, this acceptance would be a betrayal.

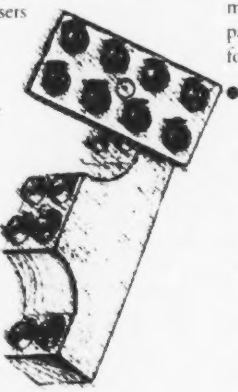
As the months wore on, Lois was able to talk more openly about death, loneliness, and her new life to be. One day, Lois knocked the tower down, allowed the princess to come out, and never played that game again.

When her mother died Lois grieved, but play therapy allowed her to deal with her great pain and loss. The images in Lois's mind became miniaturised games that she could control, even though she could not control or prevent her mother's death.

Case 2

A toilet phobia: desensitisation, behaviour modification, and art as therapy techniques

A six-year-old child Robert Fraser (not his real name) had a toilet phobia. It began when his parents installed a swimming pool in their yard. Robert noticed the filter and was convinced that he would be sucked down the drain. That day he refused to go to the toilet and urinated in the wooded area behind the house. For four days he did this and became constipated, refusing to have a bowel movement. The Frasers finally convinced Robert to use one toilet in their home by covering the hole with toilet paper. Robert was still afraid but complied. This was the only toilet he would use. This incident occurred when Robert was five, approximately a year before he entered treatment. During that year, Robert, who was in kindergarten, refused to use the school toilet and would not use toilets in restaurants or in the homes of relatives or friends. The family was in distress. Robert controlled their lives to the extent that they no longer dined out, cancelled a vacation because a motel bathroom frightened him, and only visited their immediate family for short periods of time. Robert has a brother one year younger who teased him and exacerbated Robert's problem.



Grandparents cajoled Robert to use their bathrooms, offering all kinds of bribes, but to no avail. During his yearly physical exam with the pediatrician Robert refused to go to the toilet to give a urine sample. He "went crazy", according to his mother, and a full-blown tantrum with kicking, screaming, and flailing of the arms and legs ensued. The pediatrician suggested psychotherapy; hence the referral to me.

Despite his phobia, Robert relates well. He is receptive to people, polite, articulate, and intelligent. At our first meeting, he asked if I would "force" him to go to the toilet. When I reassured him that I would not, he seemed more relaxed and was able to tell me that "toilets bother me". My plan was to ignore the toilet situation until rapport was firmly established and I could sense that Robert trusted me. I discovered that Robert's favourite toys were Bigfoot trucks and "any kind of car or truck". We played with cars and trucks on the floor, building garages, warehouses, filling stations, and carports.

I saw Robert twice a week for two weeks before I introduced some relaxation training. He sat in a large armchair and followed my suggestions to relax his body. I then paired a pleasant image that he chose (playing happily with his truck) and an image of the toilet. Robert was asked to give me a number from one to ten (one meaning that he felt comfortable and ten meaning that he felt upset) as he imaged these stimuli. Gradually Robert could image a toilet and say "one". When I was sure he could do this, I began a multi-therapeutic approach, involving his parents as well. The plan involved the following:

- *Bibliotherapy* — Robert's parents took turns reading a book to him from a selected list of stories about characters who initially feared something but who conquered their fears. Fears were of the dark, of imaginary monsters, of moving, of going to school, and so on. I also made up stories called Robert the Brave. Each simple plot depicted Robert rescuing a small animal or going on a journey to a "scary" place, only to discover that the inhabitants were friendly people and animals. Robert was encouraged to draw any character or object he wished at the conclusion of each story. Robert also made a "badge of courage" for himself.

- *Arts and crafts* — Robert revealed to me that three things lived in the toilet that scared him — a snake, a crocodile, and a scary fish. "I know they are in my imagination, but I can't help it." Robert drew these animals over and over. He drew "spears and slingshots" to kill them and cages around them. Sometimes he crumpled the drawings, tore them up, and threw them in the wastebasket. He did this with glee, exorcising his frightening images.
- *Play therapy* — Not only did we continue our car and truck game, so that Robert would have some sense of fun and relief in our sessions, but I now introduced the toy toilet and miniature dolls from the doll's house. Robert would put a Play Doh snake in the toilet and place the doll on the toilet. He verbalised his fears at first, but gradually he removed the "snake", saying, "It's really not there." He drew a picture of a snake emerging from a toilet. The snake "bit the boy on the face". He drew this several times during our sessions, until finally he stated, "This can't happen, because there really are no snakes in there." But Robert still needed paper over the hole in his parents' toilet.
- *Visits to the zoo* — I encouraged the Frasers to take Robert to the local zoo to see the snakes and crocodiles, and to visit the aquarium to see the sharks.
- *Behaviour chart* — In my sessions with the Frasers, I discovered that Robert had no responsibilities at home. We set up a plan whereby Robert would perform two daily chores — take out the garbage and make his bed. He would get a star on a chart each day he complied. A week's worth of stars led to a small allowance. I wanted Robert to feel responsible and grown-up and to develop a more positive image.
- *Systematic desensitisation and behaviour modification* — I began to shape Robert's behaviour by moving from my playroom to the hall, to the bathroom, to the toilet, to the handle, to watching me flush the toilet, to both of us flushing the toilet together, Robert flushing it alone, and entering the toilet alone. At each step, Robert reported a number to me. When he eventually could say "one", we proceeded to the next step. In addition, I offered Robert some images to protect him. He chose a shield, a light, and Bigfoot. Armed with these protectors, he could approach his imaginary demons and remain in control of his fears.

Thus, with all of these approaches working simultaneously, progress was made. Robert was able to use both of his parents' bathrooms, followed by use of the bathrooms in the homes of both sets of grandparents. Soon he was able to use all four bathrooms, eliminating the need for paper over the holes. The drawings continued, but now Robert told me that he was no longer afraid of snakes and scary fish. He only drew crocodiles and molded them out of Play Doh. As these fears subsided, the Frasers took Robert and his brother on an all-day outing in a boat. I prepared Robert for this by discussing the toilet on the boat: that he could use paper if he really had to cover that hole; that he could use his protectors to help him; and by giving him ample time to draw his crocodiles and practise the relaxation technique.

Robert had a successful boat trip. He bounded into my playroom the next session to report that "I didn't even need paper on the hole". He was proud of himself. Robert began to see that he could try out strange bathrooms and remain safe. The exciting moment came when he announced that he was willing to go to my toilet alone when he had to urinate. He ran in by himself, urinated, and flushed the toilet. He came out grinning from ear to ear. This was the first time he had used a toilet by himself since the onset of the phobia.

One important place needed to be confronted — the toilet in the school he was about to attend. I decided to use *in vivo* treatment, that is, treating Robert in the natural setting, the school. The summer break was ideal as there were no other children around who might cause him embarrassment. I followed the step-by-step procedure that I had used earlier in his treatment. We approached the bathroom that he would be using in the school while Robert used our number system and his protective images, which afforded him a sense of control. He was able to explore the bathrooms, enter the stalls with me, and watch me flush the two toilets and the three urinals. After this session, we talked about his feelings. Robert insisted that he did not need to draw his scary crocodiles and had no fear of "anything" in the toilet. He preferred to draw boats and flags instead.

After three sessions, Robert was able to flush all the toilets and remain in the bathroom alone while I waited just outside the door, where he could hear me. By the fourth session he was able to use a stall while I remained outside the stall door. Robert closed the door, used no paper to cover the hole, urinated, and flushed the toilet. He emerged triumphant, beaming, and said, "I did it". He was clearly proud of this major accomplishment — and so was I.

The following week Robert was able to use the bathroom alone, while I waited outside the bathroom door. Robert again felt joy and relief that he was able to remain in the bathroom alone while urinating. Robert and I summed up our experiences over the past few months at the end of this session. He had mastered his problem. During our last session in the playroom Robert asked if he could tear up the remainder of his former drawings of the snakes, crocodiles, and scary fish. The phobia was no longer present, and in general, Robert had a more positive self-concept, felt more confident, and as he put it, "I know what 'responsible' means".

Summary

I believe that play can be healing and that the success in both Lois's and Robert's situations was attained because I tried to establish a supportive, non-judgmental atmosphere. As the children began to trust me, they expressed their fears and anxieties. What they could not put into words emerged through their play or artwork. Our alliance, based on trust and mutual respect, led to important changes in each child. Lois was better able to endure the pain of loss, and Robert began to master a paralysing phobia. Images of terrible consequences that had led to the pain of both of these children became a source of strength as they played out their fantasies and recovered.

NOTES

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The author's interaction with "nonplayers" is described in:

Singer, D. (1993). *Playing for their lives: How troubled children are helped by play therapy*. New York: Free Press.

"Joyous abandon" is described in:

O'Connor, K. J. (1991). *The play therapy primer*. New York: Wiley.

That children develop scripts so that pretend play has order and meaning is from:

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set two, 1996

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note Ed

set *2, 1996* looks beyond the school gates, to some of the educational issues schools face when dealing with their wider community.

Parents are an important factor in helping schools achieve their educational goals. Relevant issues include: looking at the home/school partnership; overcoming cross-cultural barriers when involving parents; and parental involvement in assessment. Researcher Julie Arthur asks the question: are parents and teachers still seen to be on different sides of the school fence?

Educational opportunities are not restricted to within the school boundary. Find out about new interactive telecommunications technologies which offer learning experiences for everyone with a computer and modem. (Don't worry, we've included *A Beginner's Guide to the Internet*!)

Roland Meighan's article on home-schooling will raise some eyebrows. Can schools learn from the home-schooling environment?

As the business world beckons schools with corporate sponsorship, Kevin Harris looks at the costs and benefits of collecting supermarket dockets.

All this, and more, to help you and your school plan strategies for next year and assess your progress in 1996.

Judith Wright, Editor

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The looseleaf articles are designed for private study, staff meetings, in-service courses, or small group discussions.
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PARENTS & TEACHERS

Building bridges for the future?

STEPHEN CRUMP University of Sydney

NAILS
E D U C A T I O N

SHONA MCLEAN

The slogan of the New South Wales Department of Education for 1995 (and 1996) is "Schools, Parents and Community: Teaching and Learning Together". This article is an account of a recent study conducted into the nature of school, parent and community links in an urban community about ten kilometres from the centre of Sydney. The study was particularly interested in whether such links provided an improved context for "teaching and learning together", though this is a tough question to answer.

The Department of School Education in New South Wales (NSWDSE) is one of the largest education systems in the world and as big as Australia's largest private companies. As such, it is responsible for providing government-controlled education to 750,000 students in 2,200 schools (70 percent of school-aged students in New South Wales), employing 60,000 people. As recent research has shown, it is one thing to assert policy. It is another to ask an organisation this large to respond in a meaningful and faithful manner to a set of priorities developed at head office level. We thus set out to explore in real school settings the implementation of policy intentions for community participation with particular reference to what teachers and parents expect of schools and each other over this issue.

Recent policy initiatives in New South Wales and Australia, as well as internationally, have been designed to reform the relationship between schools and community into partnership. Yet there is little research on the extent of parent involvement policy-in-use and, thus, about whether a genuine partnership really is emerging locally or in overseas contexts. As teachers know, there is an immediacy of these issues and it is a hot topic in public debate. Who should own the schools? and how might such ownership operate?

The history of the position of teacher unions on this matter is ambiguous. While the tack chosen differs from state to state, teacher unions generally block parent representation in areas the unions claim belong to teachers' professional privilege. In a 1995 unsigned article in *The Australian Educator*, the Australian Education Union (AEU) appears to condone a view that focuses on fears about unrepresentative groups who try to cross this line and exercise control. The AEU position appears to be one of parents/community acting in an advisory capacity only, even though the article illustrates over 20 years of experience in Victoria where, according to Anne Davies of the Federated Teachers Union, "The notion of partnership doesn't give any one group total control."

Newly elected president of the New South Wales Teachers Federation (NSWTF), Denis Fitzgerald, wrote officially (in an article entitled *Loco parentis*) that he thought parents had "gone loco" and were to blame for a litany of problems the NSWTF used to blame on the Liberal/National Party government. Fitzgerald may yet regret this attempt at schoolyard wit, though not unless he is able to see beyond the limited stereotype that "sensible" parents are there to "support teachers". The irony is that Fitzgerald claims to be arguing against "the empowerment of one group against another" when the NSWTF and New South Wales Department of School Education have held a hugely disproportionate power over parents about what is done to children in schools for over 100 years. Fitzgerald fears that involving parents will generate an adversarial climate yet goes on in the same article to adversarily lock parents out of enterprise bargaining, staffing and curriculum matters!

Teachers, many of whom are themselves parents, know the value of education for a family. There are "irrational" parents but there are poor teachers, bricklayers, trade union officials, taxi drivers, pilots etcetera. Schools must be accountable for what they do to and for children who are compelled by the state to attend. Poor teaching, just like poor parenting, is likely to stem from a failure of the system, of the structures within which we live and work. The Victorian example (of over 20 years of partnership) indicates how a real partnership enhances the trust between home and the school as well as advancing genuine examples of democratic action at the school level. Is it too much to ask that other states learn from this?

NEW SOUTH WALES PRIORITIES FOR 1995

New South Wales government priorities for 1995, outlined below, concentrate on parent participation/involvement assisting them in the implementation of broad policy goals. In many cases, these are specific to literacy, school governance or assessment issues so do not raise basic principles about parent and teacher rights and responsibilities. They are teacher-focused, teacher-generated and held to account by teachers, even though they manage to extend the stereotype beyond canteen help and fund-raising.

The NSWDSE states, in the priorities documents, that parents have a right to information about their children's learning and the community [illegible] to information about the [illegible]ements of its schools. The actual goals [illegible]

In 1995 we will:

- explain outcomes-based education to parents,
- set clear expectations about student homework,
- improve school reporting on student achievement and progress,
- explain basic skills testing results better, and
- report the findings of quality assurance school reviews.

We will measure our success through:

- increased parent awareness of new curriculum approaches,
- positive parent response to new reporting procedures,
- the extent of parent involvement in homework, and
- follow-up of school review findings.

The priority "community participation" begins with the statement "Parents and teachers are partners in the education of children... Schools are most effective when their teaching and learning programs reflect the needs and aspirations of students and their communities." The Department of School Education views these needs and aspirations as expressed through "school councils and parent organisations [which] provide a focus for local decision-making and an opportunity for parents, staff and other community members to set collaboratively the goals and policies of schools." For the purposes of our research, this was an untested assertion. The stated goals of the NSWDSE for 1995 are:

In 1995 we will:

- support the effective operation of school councils,
- increase parent and community participation in school planning and decision making,
- expand parenting programs,
- improve procedures for monitoring and responding to parent/community concerns, and
- promote community awareness of the goals and achievements of public education.

We will measure our success through:

- the effectiveness of school councils,
- parent and community response to training and support materials,
- positive media coverage of the achievements of schools and their communities, and
- parent/community satisfaction with the quality of service provided by schools.

This is an ambitious agenda and it is not surprising that the Department of School Education decided to maintain these over two years. There is every likelihood that much more time will be needed for something measurable to occur, given the lack of fidelity in policy implementation noted over many years. Let me stress, these are worthy objectives. However, before looking at the research data, I remind readers of my opening comments about the possibilities of achieving change and response in an organisation as large and bureaucratic as the NSWDSE. The process of forming official School Councils has been slow despite vigorous encouragement in some clusters and regions. Organisational histories and individual fears combine with a poor model to restrict work on the sorts of bridges teachers and parents need if schools are to be effective in the future.

TABLE 1: Survey Data (percentages)
Baysview 1994

- 65% of parents/families in the Baysview data felt very strongly (YES) that teachers cared at their child's school and 33% felt this strongly (yes). Only 2% responded negatively (NO, no).
- On addition, 66% of those responding felt very welcome at the classroom.
- Families felt that schools send out clear messages [73% =YES], and reach most homes with invitations to school events [76% =YES].
- Most families thought that schools have an active Parents and Citizens Association [57% =YES; 37% = yes]. However, only 25% reported attending meetings and, even then, documentary and anecdotal evidence indicates self-report for P&C attendance was exaggerated.
- Community support [52% =YES] and partnerships [60% =YES] were acknowledged.
- 60% of families reported having the same level of involvement as for the previous year (1993) [7% =more; 16% =less].
- Most responses stated that they helped their child with writing, reading and mathematics though 82% [46% =YES; 36% = yes] responded they could help more if shown how.
- A very high percentage [98%] of parents stated they talk to their child about school.
- However, 27% reported they had not visited their child's class [though 47% did regularly] and 26% had not talked to their child's teacher.
- A "significant" group [29%] reported having different goals for their child than the school.
- Just as many families [27%] replied they had not been told the skills their child needed to learn.
- 35% of homes responded YES to being contacted about problems the teacher reported about their child. Only 14% responded YES for being contacted about improvement in their child's work or behaviour.
- For other forms of contact between the school and home, 64% reported contact about fund-raising, 49% about committee membership, 33% about community services and 27% about school maintenance.

N = 281/7 urban primary schools

THE RESEARCH

In 1994 the researchers and some parents and teachers adapted the Johns Hopkins University survey of home/school connections, tested in hundreds of sites in the United States. We then applied it to eight primary schools in what we called the "Baysview" cluster of schools which provided a discrete and coherent administrative and geographical location and variation in socio-economic status and ethnicity (as established through 1992 Census statistics). Surveys and interview questions were approved by the Human Ethics Committee of the University of Sydney. The study sought both depth and breadth of data sources to construct, through triangulation of research strategies and techniques, as full a picture as possible within research limits of what was occurring. In August 1994, 467 surveys were distributed randomly to families across all classes in the seven core schools (one trial school) with a return rate of 61 percent. Ninety surveys went out to teachers in those schools with a return rate of 63 percent.

TABLE 2: School-Home Links in Baysview Community

CURRENT STRATEGIES

- "Welcome" pamphlet and public display posters,
- weekly newsletter (which includes in varied degrees and frequency):
  - School Counsellor notes to parents regarding child raising and support,
  - class newsletter,
  - community news items, sports clubs, community notices and the like,
  - notices from local community centres and long day child care centres,
  - minutes from the Parents and Citizens Association meetings,
  - publicity about public meetings (for example, regarding a School Council),
  - a section in Italian, Chinese and other community languages, and
  - excursion information and permission notes attached to encourage reading,
- Grandparents Day;
- visits by ex-students;
- television broadcasts (for example, on Australian National Television and Channel 10) for:
  - achievement of healthy basis for food in canteen (1992),
  - Aussie Sports Fun 1993 (high school students tutoring sports' skills), and
  - Basic Skills Test 1993 (Year 3 students),
- visits by children at long day child care centres to infant classes (junior or Year 0 classes),
- systems for parent helpers for classroom, sports/swimming carnivals, excursions, library and maintenance,
- invitations parents/caregivers to attend, free of charge, professional performances (music, story-telling),
- combined Scripture services for Easter and Christmas with invitation to parents,
- parent-teacher talks organised on a formal basis by the school,
- "Thank You" end-of-year lunch for parent/community supporters, and for teachers,
- regular local newspaper items,
- parent/family surveys,
- read-with-me club (parents reading with children at home),
- intensive reading tutor program (parents reading with children in classrooms);
- League of Schools Reaching Out Committee (at Northford PS);
- school drama night or music/dance concerts,
- links to Safety House Program,
- parent organised fair/fetes,
- more regular feedback slips on weekly newsletter; and
- 1994 Year of the Family activities.

POSSIBLE FUTURE STRATEGIES

- coffee/doughnut "Let's Talk" sessions (one per term or at distribution of Reports);
- increase the number of phone lines into school/improve school reception space and practices;
- distribute school weekly bulletin to local radio in addition to local newspapers,
- parent-teacher homework liaison,
- develop links to Inner West Learning Difficulties Parent Support Group;
- parent workshops on learning and child-raising issues and on how to talk to teachers,
- Parent-Teacher Action Team (problem-solving group for a particular issue),
- teacher workshops on improving parent-teacher interviews; working with volunteer parents; school evaluation; development of school policy on community involvement; getting publicity; talking to parents...;
- parent liaison person for each class with telephone tree to assist and mediate,
- inter-school visits for parent-teacher groups (within Baysview Cluster),
- parents to publish one school bulletin per term,
- school birthday and appropriate activities,
- pupils address Parents and Citizens Committee and the School Council,
- develop a register of parent-community resource people/willing helpers, and
- organise free child care for school-home related meetings.

Examples of the types of questions asked are:

Question 1: We would like to know how you feel right now.

Q1.1 Teachers at this school care about my child.

Q1.2 I feel welcome at this school.

Where "NO" means DISAGREE A LOT;
"no" means DISAGREE A LITTLE;
"yes" means AGREE A LITTLE; and
"YES" means AGREE STRONGLY.

Question 4: Circle one choice for each statement if the school has done these things in the last 12 months.

Q4.3 Send home clear messages that I can read easily.

Q4.5 Invite me to events at the school.

Where "NO" means NEVER;
"no" means HARDLY EVER;
"yes" means ONE OR TWO TIMES; and
"YES" means SEVERAL TIMES (the school has done in the last 12 months).

Responses were evenly split between families with female and male pupils (49.8 percent): 80 percent were filled in by the mother, 16 percent by the father and the rest by other relatives/guardians at >1 percent each. Of the responses: 56 percent had one child at the school, 36 percent had two children, seven percent had three children and one percent four or more. The full data for individual sites is held by each school. In the short summary below we provide a series of key positive and negative findings of the 281 responses completed sufficiently for analysis. The responses, expressed in percentages, are listed in Table 1.

In a nutshell, what these numbers indicate is that parents/families/caregivers have a respect and faith in the education provided for their children. In tandem with that, and not at all contradictory or undermining the former, the responses indicate a desire to know more about what happens in classrooms so that the home can play a more constructive role in their child's learning and in the teaching/learning activities of the school as a whole. The defences constructed by the NSWTF, as outlined above, thus appear unnecessary unless one is unable to contemplate any other role for parents than subservient uncritical "support". Any perusal of the literature on the changing nature of what it means to be a "professional" tells us that doctors, lawyers, architects and so on are becoming much less authoritarian in making decisions *with* (not *for*) their clients. Teachers have long been good at this but they need to shy away from anyone claiming that education is a special case and that things are too complex for outsiders to understand and contribute to. Arrogance does not become us.

DISCUSSION

I will address a few items that, in interviews and subsequent meetings with the schools, caused most interest and comment. One example is the extremely high percentage of homes that recognised teachers cared and felt the school was welcoming. When we presented this data at an American conference, the discussant did not believe our data! Our defence is too involved to go into here but one can readily bring to mind the type of negative stereotypes that abound about teachers and parents, and the destructive myths built on notions of blame. Yet we believe the core figure is a true reflection of what happens in most school communities. That is, about two-thirds of families are reasonably confident in what the school is doing and feel welcome and valued. Similar numbers of homes are happy about communication levels and willingness to encourage a partnership between home and the school.

However, there is a converse reality. About one third feel the home has goals for their children which are different from those promoted by the school. Similarly, about one-third had not visited their child's classroom more than half way through the school year and nearly as many had not talked to their child's teacher. Of course, the reasons for this are varied and legitimate. But these numbers suggest a pattern of breakdown between the home and school that can not be ignored if the school wants to provide the best possible education for each child under its care. As a group, homes and school need to ensure that what they do together generates a dynamic, healthy and forward-looking culture.

Thus, having a school community feeling confident in what the school is doing may not be enough to ensure that the best teaching and learning is going on. Parental satisfaction does not mean that families can no[illegible] should not also desire further, more [illegible] connections. Table 2 lists an [illegible]sive range of school-home links. Mo[illegible] these are school-initiated, much [illegible]redit of the teachers who work hard [illegible]ing out to homes. Increasingly, hom[illegible] reaching in to the school seeking a place [illegible] the[illegible] and knowledge in the forms of k[illegible] validated in the school setting. Those schools responding to this are able to fashion in a rich and new way the things they do to educate young people about subject knowledge and life skills.

Some individual parents or local communities are seeking to reach in with their values and beliefs. This is a real challenge for a democratic society and there needs to be a more soph[illegible] response to finding ways to attune publ[illegible]n to the [illegible] public. An overriding responsibility [illegible] and social justice needs to take account not only of what the teaching profession believes, but also of what those who are its targets believe; those whose actions will express the desires and fears of a pluralistic society expressing ideals of tolerance and free will.

REFLECTIONS

What the Baysview story tells us is that parents and teachers are building bridges to the future in finding ways for parents to be more involved in their child's education. Schools are willing to encourage the involvement of parents and break away from the traditional processes of parent/school connections. Whether this is enough to make penetrating change is questionable but the development of open communication between family, school and community is a good start to providing a springboard for better practice.

Education policy, in current initiatives, concentrates on schools trying to achieve things as a community. Attempts by parents to participate, rather than be involved, in schools have a long history and should not be construed as mainly a threatening creation of New Right politics. Chitty (1994) illustrates this (for the United Kingdom) by reference to the "vigorous expansion of parent interest in education" that took place in the 1960s as part of a radical and progressive spirit. Brown and Reeve (1993) illustrate this (for Australia) in their study of parent participation, equality and democracy as expressed in the 1980s. What is changing in the 1990s is the nature and extent of the links between school and home and this article has given some insights into what these are and the extent to which they are effective and constructive, or not.

There is little doubt that the answers to these questions are vital to policy-makers, administrators and practitioners at all levels as they seek solutions today for the twenty-first century school. They also have profound implications for teacher education for, without adequate initial experiences in their pre-service program, beginning teachers will be overwhelmed by the idea of consulting and working closely with the local community.

NOTES

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This research was undertaken in collaboration with Professor Ken Eltis, University of Sydney. The views expressed in this article the author's. In 1995/6 the project was expanded to explore the Catholic Education sector as well as other non-government providers.

The author wishes to acknowledge funding for the project for 1994 provided from a URGS grant of the University of Sydney and for 1995 by the Australian Research Council. Permission for the research was granted by the Metropolitan East Region of the New South Wales Department of School Education. Research assistance was [illegible]ovided most ably by Tanya Mawson and Rosalie Robinson.

[illegible]etails of the study can be found in:

Cru[illegible]S.J. & Eltis, K.J. (1995, April). *School-home [illegible]s: Political relations in policy implementation.* [illegible]nted to the Annual Meeting of the American [illegible]al Research Association, San Francisco.

[illegible]fficulties involved in translating policy to action is [illegible]orted by:

Ball, S.J. (1994). *Education reform – A critical and post-structural approach.* Buckingham: Open University Press.

The quote "Who should own the schools?" is from:

Glenn, C. (1992). Who should own the schools? *Equity and Choice, 9* (1), 59-63.

That the Australian Education Union appears to condone a view focusing on fears of unrepresentative groups is referenced to:

The Australian Educator, 45 (1), 9-12. Unsigned letter.

Denis Fitzgerald's "gone loco" quote is from:

Fitzgerald, D. (1995). Loco Parentis. *Education, 76* (11), 8.

The priority given to community participation is expressed in:

Boston, K. (1995). *1995 – New South Wales Department of School Education priorities.* Sydney: New South Wales Department of School Education.

The lack of fidelity in policy implementation is noted in:

Crump, S.J. (1993). *School-centred leadership: Putting policy into practice.* Melbourne: Thomas Nelson.

Details of the data regarding family views of schools presented to an American audience can be found in:

Crump, S.J. & Eltis, K.J. (1995), see above.

The long history of parent involvement in the United Kingdom is recorded on page 10 of:

Chitty, C. (1994). Consensus to conflict: The structure of educational decision-making transformed. In D. Scott (Ed.), *Accountability and control in educational settings.* London: Cassell.

and for Australia, in:

Brown, J. & Reeve, P. (1993). Parent participation, equality and democracy. In D. Smith (Ed.), *Australian curriculum reform: action and reaction.* Canberra: ACSA.

For further reading on home/school links see:

Ames, C. (1993). How school-to-home communications influence parent beliefs and perceptions. *Equity and Choice, 9* (3), 44-49.

Epstein, J. (1989). Five types of parent involvement: Linking practice and outcomes. In J. Epstein (Ed.), *School and family connections: Preparing educators to involve families* (pp. 1-10). Baltimore: Johns Hopkins University.

Shipley, D.G. What is a community? *Equity and Choice, 8* (3), 19-23.

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The Corporate Invasion of $chooling:

SOME IMPLICATIONS FOR PUPILS, TEACHERS, AND EDUCATION

Kevin Harris Macquarie University

"In the grade schools throughout America are nearly 23,000,000 young girls and boys. These children eat food, wear out clothes, use soap. They are consumers today and will be the buyers of tomorrow. Here is a vast market for your products. Sell these children on your brand name and they will insist that their parents buy no other."

Packard (1957)

INTRODUCTION

In 1979 Sheila Harty published *Hucksters in the Classroom: A Review of Industry Propaganda in Schools.* Her book revealed the extent to which commercial interests had infiltrated the little red school house, and how comprehensively they had influenced school curricula and resources.

Given that schools had only about one percent of their educational budget available for curriculum resource material many welcomed, or quietly accepted, commercial offerings. Harty details many teachers praising corporate provision of materials to schools. She notes also the long tradition of industry appropriation in schools, as well as the fine line between what may or may not be considered acceptable. She says:

> Although most parents and teachers may agree that schools should be protected neutral zones from commercial exploitation, consider what is already permitted. Commercial sponsors provide the schools with pencils, book covers, notebooks, posters, information and recruitment booths, field trips, career day billboards, scoreboards, benches, vending machines, school newspaper ads, yearbook patrons, service club sponsors, honor student prizes, graduation gifts, collection drives, essay contests, fund raisers, and candy sales. Given this array, most school administrators would be hard pressed to draw the line at corporate sponsored educational materials when students are already the target for so many commercial messages on school grounds.

Harty showed that schools are easy, highly sought targets for commerce and industry, and that once the thin end of the wedge has been put into place, corporate appropriation becomes increasingly difficult to oppose.

But in 1979 few had even dreamed of things such as Whittle Communication's Channel One beaming programs and advertisements into schools, with pupils compelled to watch in return for the school having accepted the equipment on which these programs, along with others, are viewed. Were *Hucksters in the Classroom* to be written today, it would be quite a different work – and one to which Australia and New Zealand could contribute significantly. In fact some are seriously suggesting that schools in New South Wales are being deliberately used to test issues and practices concerning corporate involvement, and to explore ways in which the corporate sector can tap a market estimated to be in the vicinity of $4 billion per year. A conference (*Consumer Kids*) in 1993 focused largely on promoting commercial products in schools, and the then Minister for Education, Training and Youth Affairs in New South Wales admitted, or boasted, that major corporate sponsorship (that is, $10,000 or more) had provided "over $10 million to support Department initiatives and help defray costs for parents" in 1992.

There was a School Council from Kent

Who said that they knew what it meant

When firms took them to dine

Plied them greatly with wine

They knew what it meant

but they went

Anon: bowdlerised
but politically correct

Corporate involvement with schooling is a reality. It is currently growing at an unprecedented and almost unchartable rate, and it is seriously reshaping the nature of schooling.

New practices have brought about new reactions and adaptations. When Channel One first beamed into schools it had no *Washington Business Roundtable Set of Principles* to contend with. When Coles Myer first sent Australian schoolchildren rooting into rubbish bins to find dockets the Australian Education Council had not produced its *National Code of Practice For Sponsorship and Promotion in School Education.* And now that the code (which is seriously flawed) has been produced, there is no legal obligation for any party to comply with it. And when, in 1993, McDonalds launched its infamous *Schools Sport Development Program* in New South Wales, and Coles Myer again sent children charging into rubbish tins, the current Schools Sponsorship Working Group, chaired by Stephen O'Doherty, Shadow Minister For Education in New South Wales, did not exist. This body has now produced a set of *Draft Guidelines.* But these really are drafty. They have not been accepted by the Minister, and even the press has denounced them. But (how the tale goes on) in September 1995 the *School Sports Foundation 2000* was created in New South Wales along similar guidelines, and this won both Ministerial and press approval.

I shall now display some contemporary instances of the changing and confusing context, and then lay out some grounds on which exploration of the complexity of the ethical (and other) issues involved can take place.

THE MATTER: SOME FAMILIAR CASES

THE "GREEN STAMPS" SYNDROME: where collected dockets, labels etc. are exchanged for prizes. (For example, the recent "Coles (for New Zealand read Foodtown; for the United Kingdom read Tesco) dockets" programs, at which time an in-joke defined a disadvantaged school as one without a Coles supermarket nearby.)

This scheme is hardly new. Harty records the Campbell's Soup *Labels For Education* programs of the 1970s where schools received electronic equipment in return for Campbell's labels. She notes that many school personnel closed their eyes to the commercial aspect of the collection drives, that one Parent Teacher Association President proudly referred to the kindergarten class as "The Campbell Soup Kids", that Campbell's publicised the $8 million it gave to schools but not how much the collection made for Campbell's, and that "one parent complained ... that a $129 piece of audio-visual equipment ... did not seem a just receipt for 23 500 cans of soup". All those points were echoed frequently in the 1993 Coles program.

I investigated how that program impinged on one school over a six month period in 1993 – over 600 children, about 480 family/carer groups, and a staff of 30 along with various ancillary helpers were deployed in collecting dockets.

Most heavily involved was the teacher charged with the collation. She examined and tallied approximately 25 000 dockets. She straightened them out, scrutinised each for "computer bonuses" which are quite difficult to find (she found over 75 000 such bonuses), she tallied the dockets, put them into $1,000 bundles as required by Coles, she reported to the children and families via handouts, she motivated classes, kept a barometer of running class totals, she stored the dockets, and did the final recording. This took four to six hours per day over 20 weeks; some from class time, some from class release time, some from lunch breaks etc. Overall she undertook 589 hours of labour; or to put it another way, she put in the equivalent of around 15 weeks work for Coles, most in time allocated for teaching and other professional purposes.

I stress that *she worked for Coles*. Thanks in significant part to her efforts, Coles was kept in the forefront of 600 childrens consciousness for six months; up to 480 family/carer groups were hassled to shop at Coles when cheaper options were available; the Coles logo was displayed at the school and on a weekly class-by-class scoreboard handed out to all pupils, and is now displayed on the new computers; and Coles was identified as the goodie among supermarkets, and possibly established as the one to frequent as an adult, because it gave schools all those computers. Bednall (1993) reports a choir at another school singing "We love you Coles" as the Coles person presented the computers.

"My" school collected dockets totalling $654,000; and got in return three (now superseded) computers. The best retail price I could negotiate (quickly) for them was $5,285. But schools, being exempt from sales tax, could have purchased them for less (and surely the cost was far less to Coles who bought in bulk and who could have booked part of the costs against taxation and advertising). Taking my retail price less 15 percent sales tax – that is, $4,500 – the school could have attained the same amount if every family/carer group donated $9.40 (some did donate cash of up to $100 rather than have their children scramble in gutters or hassle shoppers for dockets), or if a computer levy of $7 had been placed on each child – which the children could have earned far more quickly through community service or educational activities. But instead children, teachers, and parents/carers put in tens of thousands of hours, and one teacher (herself largely typical of thousands around the country) put in 589 hours of trivial labour which inefficiently served the educational interests of children, but which probably did much to serve the commercial interests of Coles Myer. This was labour about which the teacher's own Union was unequivocal. In its Policy Statement *(Sponsorship ... Public Schools)* of October 1992, re-released on 6 August 1993, the New South Wales Teachers Federation declared that:

> The behavior of many teachers in putting pressure on children to shop at particular stores in order to gain benefits for the school can only be seen as unethical.

Coles, like Campbell's, made exuberant announcements about giving equipment "valued" in excess of $35 million to schools yet remained silent on the point that this represented dockets (sales) of between $4 and $9 billion, depending on Coles' purchase price of the equipment.

THE "YOU SCRATCH MY BACK AND I'LL SCRATCH YOURS" SYSTEM: or accepting corporate sponsorship and in return supporting the sponsor.

The most notorious recent example is what the New South Wales Department of School Education called the *McDonalds School Sport Development Program*. McDonalds offered a three-year $800,000 sports sponsorship to New South Wales schools (this works out at 33c/pupil/year – not a huge amount to recoup from a captured lifetime client) and teachers were informed that in return they might care to indicate support for McDonalds and set up links between schools and McDonalds.

This case raises major issues regarding schools' and teachers' involvement with a company whose marketing practices are questionable and whose products seem not to fit well with dietary messages given by schools. But it is also worth considering certain details relating to the promotion, as stated in the communication sent by the Sport Unit of the New South Wales Department of School Education to all government schools in May 1993.

Firstly – McDonalds is presented as "a good corporate citizen" with a "young vibrant image" and "a good work ethic".

Secondly – there is the deep-seated and prevailing concern about the "fit" between McDonalds' products and certain values schools promote is turned on its head when McDonalds is heralded as "a very suitable vehicle for the promotion of school sport".

Thirdly – there is a neat *fait accompli*. McDonalds is announced as an Australian Olympic Team Sponsor which has "a significant existing presence in schools nationally through sponsorship". McDonalds is thus introduced as a family member, not an outsider seeking admission.

But of most significance was the seeking of teachers' "co-operation and involvement" with McDonalds, and the ways suggested by which teachers "may care to" indicate "support for McDonalds". Six suggestions were given:

- meet McDonalds representatives,
- inform McDonalds of important school events,
- associate McDonalds with major school reward situations,
- establish varied links between McDonalds and the school,
- promote school events in McDonalds stores,
- display McDonalds name and logo in schools.

This raised a public furore. The press made merry with it. The Director General of School Education in New South Wales insisted that schools are bound only to display McDonalds' name and logo in certain places on certain occasions (yet he revealed that the Department of School Education itself is bound much more strongly). The Minister backpedaled furiously without completely

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dumping on the Sport Unit and without negative comment about McDonalds. And the New South Wales Teachers' Federation stated its position in both the public press and through a letter to schools. An eight-page policy statement attached to the letter to schools noted that "Teachers are not paid from public funds to promote commercially produced products or services." It indicated further that supporting sponsorship can "compromise the professional integrity of teachers" and divert them into performing activities which advantage business at the expense of equitable, quality education. The statement ended thus:

> Public Schools are institutions established for children, in which they are to learn and be taken care of. Schools are not there to provide marketing opportunities, or provide opportunities for "Business" to exploit children.

McDonalds, in turn, introduced the "McHappy Hour" at some outlets, whereby local schools are given a percentage of the money spent by pupils and teachers during a specified period of the day. To my knowledge no school has yet returned the cheque.

THE "PRODUCT REWARD" SYSTEM: in which valuable educational tasks are rewarded with the sponsor's product.

The epitome of this type of promotion is the *Book-It National Reading Incentive Program*, launched under the auspices of, and endorsed by, the Children's Book Council of Australia, the Australian Council For the Arts, the National Library of Australia, and the National Book Council. The principal rewards for reading achievements are gold stars and pizzas, to be claimed at Pizza Hut (where virtually all rewarded children would have to be brought as part of a family group). This promotion also contained the questionable practices of offering class rewards but only when every member of the class participated successfully, and offering prizes for teachers supporting the scheme. This sort of promotion redefines schooling and teachers' work in such a way as to make it extremely difficult to separate educational and commercial aspects.

ETHICAL, EDUCATIONAL AND PROFESSIONAL CONCERNS

Teachers, school administrators, and the public respond to corporate involvement in schooling in a wide number of ways. There is a lot of negative reaction. But there is a lot of positive reaction too. The "Book-It" promoters claim that in Australia over 14 800 teachers along with 400 000 children in 1700 schools participated in the program in 1992; Coles boasted that 7048 schools, or 85 percent of all possible schools, "enrolled in their 1993 program"; Mars quickly followed suit with a wrapper-collecting program (stating that its aim was not to increase sales but to assist schools and "at the same time keep the streets free of wrappers"); Tesco re-ran a copy-cat program in the United Kingdom in 1994; and I suspect we all know at least one parent, teacher, and/or academic who expounds some variation of the line that if it helps children read, gets computers for schools, or supplies sports equipment or curriculum resources, then what's wrong with collecting dockets or accepting sponsorships?

So what might educators say and do in the face of such realities? Here I merely indicate some ethical and professional matters raised by the instances presented, and in the place of thorough discussion simply pose central questions that need addressing.

Firstly – we need to recognise that there are differences in kind, degree, intent, and effect of corporate involvement in schooling. Over-generalising is dangerous, and we should consider what sorts of corporate involvement in schooling warrant objecting to, and why. We might also consider whether we can justifiably adopt a "partially pregnant" or "I'm not addicted" position. It is commonly claimed that going along with the corporate sector "once or twice" or just a little bit, can't hurt – and that, after all, we can pull out any time we wish. But can we? And are schooling and education irrevocably sullied by once or twice bathing, or just paddling, in muddy waters?

This leads directly to the perennial issue of whether the ends can ever justify the means. It's frequently claimed that corporate involvement directly assists students; that there may be no other way to get the goodies on offer (for poor schools there usually isn't, and they are the ones almost literally forced into the programs); and that if any particular school doesn't co-operate other schools will get the share that non-participating schools forfeit (this argument was frequently articulated with regard to the Coles program). Campaigns such as the Coles program disintegrate if no schools participate (try getting solidarity among schools on that!) and serve participating schools more when others choose not to participate.

Thirdly – we need to recognise that we are dealing with a historically-developing phenomenon. The thin end of the corporate wedge got into schools long before Harty's earliest identifications. And since both schooling and teachers' work are historically changing things, should they now be more responsive to, and co-operative with, the corporate sector? Are schools now part of, rather than remote from, "the real world" of corporatism; and what, if anything, is special about schools, and schoolchildren? We commonly hear that times have changed, that schools (like other institutions) now have to compete for funds in a harsher, leaner world; and that children and schools ought be exposed to, rather than be "protected from", the corporate sector. There are many sticky issues involved here relating to the nature and purpose of schooling, the needs of schools, the age of pupil targets, and how all of that fits with various forms of corporate involvement in schooling.

Sub-themes of this case claim that in times such as these, when governments promote competition and self-determination, so too should schools and teachers; that in the modern world we can't easily draw the line around what is or is not corporate sponsored material; and that corporate involvement in schooling is actually good for children (defenders of this position identify the language of critics ["invasion", "exploitation", "intrusion", "appropriation" etc.] as the real villain of the piece).

We might ask further whether the corporate involvement issue is just a variant of the old technology case: namely it all boils down to how you use it. It is often claimed that corporate involvement can be turned against itself. For example, Whittle provides the very commercials that are easy meat for media studies and deconstruction exercises. The McDonalds logo in classrooms can continually draw children's awareness to nutritional problems with a steady McDonalds diet. The Coles program can provide, along with computers, awareness of seeking out price benefits rather than gimmicks (you can even use their computers to construct budgets and build data bases of rival supermarket prices). So – why not take the money, shoot the messenger, and run?

A fifth major issue is that of identifying and evaluating the role of the corporate sector, and the impact of corporate involvement, in defining teachers' work. The New South Wales Teachers Federation (1992) simplistically declared that "Time spent in ... providing returns to sponsors is time spent away from teaching, or preparation ...." However, others claim that working with sponsors is now a necessary and legitimate part of teaching and teachers' work. Are those who oppose this like my teacher back in 1948 who, at the age of 65, made a last desperate attempt to keep the ball-point pen out of classrooms?

Tangentially related to this is the matter of whether corporate involvement gives greater power and responsibility to teachers (and others) in schools. In New South Wales both the Director General of School Education and the former Minister insist that the decision to go with the corporate sector or not is to be made at the school level. The Director General has announced:

> The Department neither approves nor endorses promotional activities for schools. The decision whether or not to dip a toe into the waters of commerce rests with each school ...

while the Minister has indicated:

> Corporate sponsorship is an option for schools which want to augment their resources for the benefit of students ...

Devolving responsibility might be fine, but lack of clear direction in such a matter could easily set up situations of unhealthy commercial and ideological competition between neighbouring schools.

The sixth issue I shall raise is "product suitability" and "promoter suitability". During the McDonalds debate the Director General in New South Wales stated that sponsorships were not to be accepted willy-nilly, and that agreements must not be entered into with companies producing weapons, cigarettes or alcohol. At the same time the Minister said:

> For sponsorships to be effective they must obviously be mutually beneficial. Schools receive funds, goods or services which enable them to improve or expand their provision and sponsors gain public recognition by having their name linked to public education.
>
> Just as businesses guard their corporate reputations, the New South Wales public education system guards its public image. Consequently, Department guidelines are explicit in stating that sponsored activities must have a clear educational rationale and sponsorship agreements may be negotiated only with reputable organisations whose public image, products and services are consistent with the values, goals and policies of public education.

But this leaves open what a "clear educational rationale" might be; not to mention the more vexed problems of the reputability of organisations, who best judges their public images, and what really goes on behind the public image. For instance, the Mitsubishi Company, which sponsors a Sydney school – ironically Forest Lodge Primary School – projects an image of a manufacturer of cars and electrical products, yet is rather less public about its activities as one of the world's major destroyers of rainforests. In a complex corporate world in which tobacco and alcohol products, and armaments, are commonly made by companies with unrelated names (Nabisco is now connected with the tobacco giant R.J. Reynolds; Remington has longer connections with producing armaments than typewriters or shavers; Southcorp is one of the world's largest wine producers as well as a whitegoods manufacturer), and in which companies known as car manufacturers also log rainforests, wise and informed decisions about who are good corporate citizens are not always easy to make. Also, situations change. Perrier may once have been a reputable sponsor; but now, as the French again blast the Pacific with nuclear devices, should school sponsorship arrangements with French companies be reconsidered?

A further problem here, as with many of the other questions raised above, is how can one make wise decisions in the face of conflicting and confusing messages? For instance, a public letter (6 August 1993) regarding the McDonalds sponsorship affair showed that Unions can be every bit as unhelpful and confusing as Ministers and Directors. The General Secretary of the New South Wales Teachers Federation stated:

> It is important to stress that the normal relationships a school has with its local community are not being questioned here. Sponsorships and support from local businesses and organisations will continue to be a part of public school activity. What we have stressed in the recent controversy has been the question of major corporate intrusion into our public schools system.

But when is corporate intrusion "major"? And how do we draw the line at what constitutes normal relations between schools, the community, and local businesses? Is it all right for Joe's local pizza place to sponsor a reading program or for Greasy Harry's Hamburger House to sponsor school sport in return for school and teacher support, or for the local picture framing business to frame prints for the library walls and quietly place its name and phone number on each frame?

CONCLUSION

Corporate involvement, sponsorship, encroachment, invasion, appropriation (call it what you will) in schooling is a reality, but it is not a simple issue. Given both the complexities involved and the confusing messages presently put about by politicians, bureaucrats, Unions, and the public, it is a matter that parents and educators might urgently and usefully focus very serious attention on.

NOTES

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He has written extensively on the politics of schooling, knowledge, and education; and is currently conducting a major investigation of the changing roles of teachers in Western Society.

Packard's quote is from page 158 of:

Packard, V. (1957). *The hidden persuaders.* London: Longman.

The quote on the extent of commercial interests in schools is from page 10 of:

Harty, S. (1979). *Hucksters in the classroom: A review of industry propaganda in schools.* Washington, D.C.: Center For Study of Responsive Law.

That schools are being used to test corporate involvement is from:

Bagnall, D. (1993, September 7). The price of dinosaur dollars. *The Bulletin.*

The figure of $4 billion per year does not take into account what the children will spend across the span of their entire adult life or what they will inveigle, charm or coerce their parents and carers to spend on items not specifically related to the child market.

That corporate sponsorship supports Department initiatives was quoted by:

Chadwick, V., New South Wales Minister for Education, Training and Youth Affairs (1993, August 6). *Open letter to school communities.*

Regarding the Schools Sponsorship Working Group, Mr O'Doherty is aware of my research, interest and publications in this field, but despite his "expressions of interest" he has chosen not to discuss the issue with me.

The Campbell's Group programs are reported on pages 34-36 of:

Harty (1979), see above.

The choir singing "We love you Coles" is reported in:

Bednall, J. (1993, May 15). Apples aren't for students. They're for Coles. *Hobart Mercury.*

The Union policy statement is referenced:

New South Wales Teachers Federation. (1992). *Sponsorship ... Public Schools.* Sydney: Author.

Statements from the New South Wales Director General of School Education on schools' obligations to McDonalds are from:

School Education News [illegible] August 11).

Statements from [illegible] Director General of Sch[illegible]ation on ind[illegible]l schools deciding to g[illegible] the corporate sector are from:

School Ed[illegible] News. (1993, August 25).

The Minis[illegible] statements on corporate [illegible] are from:

Chadwick (1993), see above.

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Getting It Together

CROSS-CULTURAL COMMUNICATION

KATH HENDERSON, WELLINGTON

KERRY GEMMILL

As a result of improved communication between home and school in 1993 the Pacific Island students of Sacred Heart College, Lower Hutt achieved significantly higher results than in any previous year and well above the New Zealand national average for Pacific Island students. This success story, relevant for any cross-cultural communication, holds the warning that continued success depends on maintaining the school/home communication channels.

DIFFERENT PERSPECTIVES — HOME AND SCHOOL

What happens when parents find that their own cultural expectations of their role conflict with their children's standpoint in a new environment?

Mr Loimata Iupati, a Tokelauan educated in Tokelau, Western Samoa and New Zealand, and past Director of the Wellington Multicultural Educational Resource Centre, explains this can happen when there is a difference of perspective between teachers and parents from different cultural backgrounds. Cultural norms with respect to education which have been transferred here by parents who were educated in other countries can be different from the New Zealand norms. For this reason, communication between home and school is often ineffective.

For instance, the usual Tokelauan perspective on the role of a parent differs from other parent perspectives commonly found in New Zealand. The role of being a parent to any child in the community, as well as one's own children, is very important. In Tokelau, every adult is responsible for overseeing and, if necessary, correcting or "telling off" any child to jointly maintain security and behavioural standards for all the children of the community. For example, any child found in the wrong place or doing something wrong will be offered food and drink and then taken to the child's own home. Tokelauan children respond to knowing that any adult is likely to know their parents and so will act as a parent. Responsibility for the general welfare and discipline of children is seen as the shared role of all parents who are also concerned with maintaining and supporting culturally important standards including attendance at church and other community occasions. But Tokelauan parents do not traditionally have a role in the academic education of their children.

Teachers are the education specialists. Mr Iupati says that Tokelauan parents regard teachers as very important people who are infallible as a "source of good things" and they "must be listened to" by children. Parents would be unlikely to question teachers' academic competence or teaching methods in any way. Parents would be likely to direct their children to "listen and learn" rather than to question.

THE SCHOOL

Early in 1992 staff and Board of Trustees members of Sacred Heart College (for girls), Lower Hutt, became very concerned about the academic performance of Pacific Island students at the college. Principal Sister Valerie says there were also cross-cultural issues of concern which it was felt could have a bearing on both the academic performance and overall development of the girls. Most of these issues related to perceived family attitudes to attendance at school, a lack of emphasis placed on study compared with other activities, practices in the home with regard to discipline, diet, the involvement of older children in child care of younger siblings, and the extent to which schoolchildren were involved in sharing cooking and other domestic duties. However, Pacific Island parents did not come along regularly to opportunities the school provided to hold discussions with teachers.

THE COMMUNITY

In 1992 Mr Filipo Lui, a senior member of the Lower Hutt Tokelauan community, an Advisory Officer with the Justice Department (now the Department for Courts) and a parent of Sacred Heart College, had already held discussions with parents who were concerned at their daughters' lack of academic progress but who were hesitant to attend the usual parent/teacher meetings or to approach the school directly to discuss the problem. Many parents relied on their daughters to interpret (and therefore control) school communications to them.

Although the parents had high hopes for their daughters' academic success, they believed, based on their own cultural experience, that the school and its teachers were responsible for the education of their children while the parents were responsible for other areas of their children's development.

The greatest problem caused by the difference in perspectives between the teachers and parents of the girls was that it placed the girls in the position of trying to fit into two different and often conflicting sets of fixed expectations and rules and this put them under enormous stress in both settings.

Teachers did not understand or take into account the cultural obligations of the girls to their families and community when school expectations were set. Parents had no understanding of what was expected of the girls at school, and indeed what the school expected of families in the way of educational support for the girls, as part of the New Zealand education process. Parents were also worried about their own obligations as Tokelauans to uphold their traditional parenting roles.

Paying the school fees and lunch and bus is only half-way there.

Two apparent results of this lack of understanding by all involved were that some of the girls were suffering from emotional distress and few were achieving academically.

THE PROGRAMME

In co-operation with Sacred Heart College staff, Filipo Lui gathered Tokelauan parents together to a special seminar on a Sunday in June, 1992, to hear issues of concern to teachers and to voice their own concerns. (A separate meeting was organised for the Samoan community parents of the college.)

Mr Iupati was invited by Mr Lui as a resource person to help parents clarify, in their own language, what the school expected of them as parents of the college and how this fitted in with their own role as parents in the Tokelauan culture. The next step was to work out practical ways they could support their daughters such as providing a quiet place for study at home, making sure children made homework and study a priority, explicitly offering support and encouragement to their daughters for their education programmes and future goals, and talking over their progress day by day.

Mr Lui says that by the end of the first seminar quite a lot of needs had been identified by parents and staff and a number of ways parents could proceed to work together with their

TABLE 1: NEW ZEALAND SCHOOL CERTIFICATE – FINAL SCORE STATISTICS

	All Pacific Island candidates studying and sitting within New Zealand			*Sacred Heart (Lower Hutt) Pacific Island candidates*		
Year	*Total single subject scores*	*Mean*	*Standard deviation*	*Total single subject scores*	*Mean*	*Standard deviation*
1992	15661	38.9	17.5	89	44.4	12.0
1993	14886	39.4	17.0	118	51.2	13.3
1994	13907	40.8	17.0	133	41.8	15.0
1995	14593	40.9	16.7	120	46.4	17.1

Source: New Zealand Qualifications Authority daughters. A total of ten seminars were held at the school on Sundays during 1992 and 1993 attended by approximately 100 members of the Tokelauan extended families and staff representatives. Mr Iupati continued to act as the chief resource person at these.

Sundays were chosen to make it easier for the families to attend. Many parents worked during the week and many of their children played sport on Saturdays. Although Sundays would normally have been difficult for many of the Tokelauan families because of their commitment to church, they decided to celebrate Mass at the school as part of the workshops and also have lunch together.

Meanwhile, Tokelauan parents were rostered from their local communities of Petone, Naenae, Upper Hutt, Wainuiomata, and Taita to visit the school during the lunch break, two days a week, two to three at a time. This demonstrated the Tokelauan community's new involvement in and commitment to the school day. Both mothers and fathers joined this roster.

The seminars also led to the formation of an evening study group for Pacific Island students, held two evenings a week at the school from 6-8 pm. The school paid for a suitable person to supervise these sessions. Where possible, Pacific Island university students were employed as supervisors to act as role models as well as academic coaches. Parents organised and provided transport to and from the study sessions and rostered themselves to act as support supervisors, helping the students learn and themselves getting an understanding of what this involves. As most parents have large families there needed to be a lot of commitment to reorganise the family meal times and obligations to make this possible. The school sometimes provided a van to collect and return students home.

Mr Lui says it is now very apparent that parents with a better education themselves can better understand the needs of their children and will respond better to programmes educating them in their role in their children's education in New Zealand.

TABLE 2: PERCENTAGE OF CANDIDATES ACHIEVING C GRADE OR BETTER PASS

	All Pacific Island candidates studying and sitting within New Zealand	*Sacred Heart College*
Year	*Percentage*	*Percentage*
1992	26.9	11.7
1993	27.9	58.3
1994	31.2	28.9
1995	31.1	38.4

Source: Sacred Heart College, Lower Hutt, derived from statistics published by the New Zealand Qualifications Authority

Sister Valerie says that all Sacred Heart College staff were informed the study group was operating and to expect greater parent awareness and support following the seminars. Staff were asked to monitor the Pacific Island students in their classes more carefully through their subject departments. Teachers found that their Pacific Island students tended to be "passive in the classroom" – they tended not to ask questions and were reluctant to give their opinions.

Teachers worked on developing new approaches to teaching and encouraging their Pacific Island students in subject classes and out-of-class time. The subject departments considered ways to focus their teaching to more actively involve all students in each class. Staff looked for ways to support and encourage their Pacific Island students such as helping coach students for Pacific Island speech contests; and encouraging them to join the extensive peer tutoring system which was in place in the school.

Meanwhile, the evening study sessions also included programmes to boost the students' self-esteem and encourage them to take a more active learning role in their classes. Some students had specific health and/or learning problems identified and addressed by health professionals and specialist teaching staff.

Sister Valerie said that attendance at the evening study group has varied. During 1993 attendance started to drop but rose when the school told parents that the programme might have to be discontinued. Sister Valerie said that further staff initiatives are planned such as having guest speakers to address staff about different teaching styles which different cultures may find easier to learn through.

THE RESULTS

In 1993 the Pacific Island students from Sacred Heart College who entered the School Certificate national assessment at the end of the fifth form (Year 11) achieved significantly higher results than in any previous year and well above the New Zealand national average for Pacific Island students (see Tables 1 and 2). Note, each year the total number of Pacific Island students entering School Certificate from Sacred Heart College is usually only approximately 25 students.

Mr Lui says that unfortunately by the time the study group moved into its third year (1994) there was a fall-off of parent involvement and support for the evening study group and so the core of a few parents who continued to run it became less enthusiastic as they felt all the responsibility rested with them. Without the support of the parents student attendance fell, as did the results at the end of that year. (See Tables 1 and 2.)

Mr Lui says the problem is to convince the parents that they have a big part to play in an ongoing way to ensure their children have academic success. Clear signs of appreciation from the school are needed to keep the commitment ongoing. The commitment must be there from all the parents while their children are at school. The academic results have shown this for the preceding years – improved results when the parent involvement was high, lower results when the involvement dropped away.

> It has to be a priority for the family. Parents can't sit back and relax and wait for the education process to make their kids succeed. Paying the school fees and lunch and bus is only half-way there.

Although the initial purpose of the group was to boost the fifth and sixth form students, some junior students also attended. Mr Lui feels that in order to build good, long-lasting, study habits the study group should focus more on the needs of the third and fourth formers (Years 9 and 10), who are just starting high school. Since parents are keen for their children to succeed in their new school, involving them with secondary school study groups at this time might result in them staying involved for a longer period.

Mr Lui believes that the Sunday workshops involving larger numbers of parents in discussions with staff and students reinforced their understanding of the needs of their children and their commitment to their duty at home to support their children's school progress in practical ways. They also learned how to provide moral support by asking

questions such as "What is happening at school?" "How is the study going?"

THE STUDENT PERSPECTIVE

I spoke to a group of 26 Pacific Island students during their lunch break in the last week of the 1994 school year. Twenty of the girls were Tokelauan and 16 said they had regularly attended the evening study group during the year. I asked them their ideas about:

- What is a good teacher?
- What is a good parent?
- What do you mean when you talk about your "cultural group"?
- What has helped or would help you to succeed with study in the future?
- What could cause problems for your education in the future?

A good teacher is "eye-to-eye" with you – not "up there"; really helps *you* as an individual; knows his/her subject and teaches it confidently; is always encouraging.

A good parent is encouraging; loving; able to "meet your needs as a person" and to "understand and accept as you adapt to the society you find you live in" as well as to "meet your physical needs" such as providing food, clothing and a home to live in; "listens to you rather than just ordering you about"; "is supportive of your dreams and goals for the future".

My cultural group is "my sense of identity"; "my traditions"; "something to belong to – a feeling of belonging and a sense of unity"; "close-knit relationships and lives"; "social functions and dances are mostly culturally based"; "comfortable"; "re-unions", "funerals, weddings, church – all important life occasions"; "it's important to have other Tokelauan students at school – I can relate to them easily and they are easy to make friends with" (unanimous agreement from the group); "our culture is spread right through our lives every day – it is not just a group to go to once a week or something".

Successful study in the future: "I feel I am developing as an individual and I have to learn more about how to motivate and control and discipline myself, because a lot of things 'out there' can limit you ... a lot of people you hang around with don't know or understand what you have to put in and give up to be successful at study"; "it really, really helps when you have school friends who support you"; "role models like at the study evenings and in the community really help"; "support of your goals by your parents is really important".

Possible future problems: "friends who don't understand and aren't motivated"; "you could lose confidence if you failed something or it took longer than you thought it would"; "money problems"; "family relationships if they don't understand why you have to make study a priority".

CROSS-CULTURAL ISSUES

Mr Lui and Mr Iupati agree that many Tokelauans have settled in New Zealand particularly because they wanted their children to have access to the New Zealand education system, even though they knew economic and other difficulties awaited them.

Many Tokelauan parents who have immigrated to New Zealand as adults have had little formal education and are unlikely to be able to offer any academic assistance to their children with homework, study methods or even to have an understanding from their own upbringing of the physical environment required for successful study at home. Still, if their children are unsuccessful at school they are likely to be disappointed and wonder why.

Mr Iupati says parents need help from schools to understand what cultural factors in their communities are in conflict with creating an environment where their children can achieve academic success, how they themselves can feel comfortable to re-adjust their own cultural practices in the home and in their close-knit communities to support their children to academic achievement while being true to their Tokelauan cultural needs.

Meanwhile, Mr Iupati believes teachers should be asking questions such as:

- What do my parents of other ethnic groups understand to be the role of a teacher?
- What do I expect parents to do when I send their child home with a book to read, or homework to do that many New Zealand parents could help their children with but these parents can't understand?
- What is likely to happen when I send a school notice home that a parent can't read?
- Can all the parents of my class understand our school reports?
- Why might some parents be reluctant to come to school "meet the teacher" and "report" evenings?
- How far is it my responsibility to make contact with them and what will I do if they don't come?

Mr Iupati believes it is crucial for schools to keep checking that they have effective communication with both parents and students.

> The child must feel that expectations from home and school are consistent with each other and that each environment is supportive of the other in order to be able to respond most positively to education opportunities. Where important issues are involved, the school is best to communicate with their ethnic community organisations as well as individual parents to ensure greater involvement.

NOTES

KATH HENDERSON began writing this article while working as a cross-cultural communications lecturer at the Wellington Multicultural Educational Resource Centre between September 1991-1993. Previously she taught for 12 years in secondary schools in Western Australia and Wellington, and currently she is a member of Workplace Communications Consultancy, PO Box 28003, Wellington, working with individuals and groups from ethnic communities and their managers to facilitate cross-cultural communications in workplaces.

Sacred Heart College, Lower Hutt (near Wellington, New Zealand) is a Catholic Integrated Secondary School for girls from forms three to seven (Years 9 to 13) with approximately 750 students. The 1994 Education Review Office report stated: "The Catholic character of the college permeates all aspects of school life." The ethnic composition in 1994 included 72.8 percent Pakeha (European descent), 8 percent Maori, 15.2 percent Pacific Island (including 4 percent Tokelauan), 0.5 percent Asian and 2.5 percent Other. The students are drawn from a range of socio-economic groups.

Factual and statistical information about the school were from:

Education Review Office. (1994). *Confirmed assurance audit report Sacred Heart College.* Wellington: Author.

New Zealand Qualifications Authority. (1996). *School Certificate results for years 1992-1995.*

In 1995 Filipo Lui and other concerned parents formed a parents-staff-students support group for the Sacred Heart primary school at [illegible] near Lower Hutt) where his nine-year-old son is a [illegible] [illegible] Iupati was also involved with setting up [illegible] and contributes as a maths tutor.

Loimata Iupati is today a community education consultant. Among other commitments he is chairperson of the Tokelauan National Language committee and through that he has been chosen as one of three Tokelauans who are translating the Bible from English into Tokelauan. He is a sitting member of both the Pacific Island Polynesian Education Foundation and the Pacific Island Advisory Board for Pacific Studies at Victoria University in Wellington.

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set two, 1996

LEARNING IN THE DISTRIBUTED CLASSROOM

[illegible]
Christchurch College of Education
Christchurch, New Zealand

The virtual classroom has come of age. Through the use of modern telecommunications technologies students can now be linked in a variety of locations, and have access to a variety of "experts" who contribute to the total learning experience. This form of teaching and learning is not bound by geographic location, and is limited only by the ability of the learner and/or teacher to establish the contacts on a local, national or international level. So why is this change occurring? What are the factors which are contributing to it? And what will be the impact on the classroom as we know it?

DISTANCE EDUCATION IN NEW ZEALAND – A POTTED HISTORY

As in other parts of the world, New Zealand has a long history of distance education serving the needs of primary and secondary students living in remote and isolated areas of the country. The Correspondence School in New Zealand is over 70 years old, and has seen the various generations of distance education come and go, beginning with the two-way postage of print based materials. Recent developments in telecommunications technologies mean the traditional paper-based courses can now be supplemented with real-time interaction between teachers and students and between students themselves.

These changes have not been ignored by the other providers of distance education in New Zealand, those serving the tertiary sector. In 1992 the New Zealand government commissioned a study to explore further how telecommunications technologies might be put to better use for the development of interactive learning systems in a wide variety of learning situations. The resulting *Consultel Report*, as it came to be known, identified three broad technologies which were already finding a market, and which needed to be promoted and supported.

These were teleconferencing (audio, video or audio-graphic communications), broadcast television, and computer mediated communications (CMC). CMC differs from the other two technologies in that it can operate in real-time (synchronously) or in delayed-time (asynchronously). Phenomenal growth in interest and use of the Internet adds strength to the argument for this technology to be taken seriously in distance education. In particular, the increase in access to and use of the World Wide Web may prove to be one of the most significant developments in schools in the latter half of this decade.

A PARADIGM SHIFT IN EDUCATION

The telecommunications "explosion" heralds our arrival in the "Information Age", with predictions of change in how we define "work", how we run our businesses, and how we structure our education system. In her description of the "classroom of the future" Dr Lalita Rajasingham of Victoria University in Wellington observes that many of today's schools have remained unchanged since her time as a pupil. Classrooms are still preparing people for life in an industrial society, while society itself is in a transition from being industrial to being an information society. In her paper, Rajasingham states:

> Conventional classrooms are a transport-based mode of education where teachers and students travel in order to meet for instruction at fixed times and locations. We travel by car, train, bus or walk. In a way this model is replicated in the industrial society where people travelled to work in factories and businesses and to entertain themselves. All of these activities took place within enclosed spaces, within four walls and at prescribed times.

Clearly, the successful integration of new information technologies into classrooms will require significant changes to the way in which our schools and classrooms are organised and run. One aspect of this change may be heralded by a quiet "revolution" which is currently challenging and changing the pedagogies which form the basis of our learning systems. Significantly, this involves the paradigm shift from where the focus of attention has been on the institution providing the instruction, to the learner as a consumer of this service.

This shift has also strongly influenced distance education. It is now no longer appropriate for an institution or education provider to see themselves as the sole provider of an educational qualification or service. Students are now empowered to make choices about where they go in order to learn, or, using telecommunications technologies, from where they can access their learning.

This shift in emphasis is set to have a dramatic impact on what is currently happening in New Zealand schools, and in fact, schools throughout the world. With the learner now able to be selective about what he or she studies and where he or she obtains the instruction, institutions and other providers will need to be considering a more co-operative approach to providing educational services. The value or worth of a course will be established by the response of the learner, and not by the perception of the provider. In the ideal open learning environment, a student's vision of how they learn might be reflected in the extent to which they are able to:

- enrol at institutions of their choice.
- enrol at various times of the year.
- study courses at different levels.
- study courses of various lengths.
- start at an appropriate point.
- learn in different modes with alternative delivery media.
- study at their own place, pace and time, as convenient.
- complete courses at their own pace.
- sit final exams or have summation assessment at various times of the year.

- resit final tests etc., and
- learn throughout their lives.

The challenge for any institution or education provider of the future will be to embrace this new paradigm of learning, and explore the use of the emerging telecommunications technologies in making their courses available to the learner. The reason for this is simple – not all learners of the future will be at school! In his recent book, *The Age of Paradox*, Charles Handy predicts that in ten years, more education will occur outside of schools. The figures on technology uptake in the homes of New Zealanders would suggest that this is not a vain thought. Already, many of our students come from homes which are more technology rich than their school classroom. Rather than ignoring this fact, or even trying to compete with it, we should be exploring ways of capitalising on it, to advantage the learners we cater for, and equip them with the skills they require to access the best learning opportunities available to them.

> **The challenge for any institution or education provider of the future will be to embrace this new paradigm of learning, and explore the use of the emerging telecommunications technologies...**

INTERACTIVE TECHNOLOGIES MAKE THE WORLD A SMALLER PLACE

So far I have discussed the potential of telecommunications technologies in providing access to "formal" learning opportunities – the provision of courses of study leading to a particular qualification or similar. But what about the potential for accessing information, and pursuing areas of research?

It is true that in the past three decades television has made a significant impact on how we view the world. Daily news bulletins are screened in our homes, with pictures of the latest disaster or diplomatic visit beamed in by satellite almost as it occurs.

The problem is that there is still something impersonal about it all – the way it is mediated for us prevents us from actually asking our own questions and pursuing our own lines of inquiry. Any good social studies teacher will tell you this falls short of really allowing students to come to understand how people think, feel and act the way they do.

Enter e-mail and the Internet. An example taken from the work of three Christchurch schools illustrates this. In the weeks prior to the elections in South Africa in 1994, fourth formers (14-year-olds) in each of the schools began a study of what life is like in South Africa, and what effect the anticipated change in government might bring. Rather than rely purely on available text books and television coverage, the teachers involved managed to establish contact via e-mail with some secondary schools in South Africa. Students were able to follow up their classroom study and discussions with an e-mail "chat" with their South Africa counterparts to check the validity of their information, and to seek first hand accounts of what was happening in the country. The results of the communications were truly remarkable. One of the teachers involved remarked that she had never had such a successful study of South Africa, that her students had come to identify closely with the students living there, and to appreciate the very human side of the situation they were in. This sort of learning is simply not available in books, nor from even the most experienced and capable teacher.

THE ROLE OF THE TEACHER

All of this raises the inevitable question – what, then, becomes the role of the teacher? As the learners become increasingly active in how they define what it is they want to know and then set about locating and processing the relevant information, the role of the teacher in the teacher/learner relationship must change. No longer can the teacher be the "fount of all knowledge" requiring students to come as empty vessels and be filled. There is an oft quoted expression in education at present – that the teacher should move from being the "sage on the stage" to being a "guide at the side". This is consistent with Doug Shale's view of the teacher as being separate from the "content" in the education process, where what is being studied is explored by both teacher and learner, and the education process becomes more a negotiation of meaning rather than a one-way discourse.

The metaphor of a sailing ship may be appropriate here. While the decision about where to go (the vision) may be determined by the captain, the crew or the owners of the boat, and the decision influenced by factors such as tide, current, cargo, etc; it is the navigator who responds to these decisions, and plots a course so that the crew can then sail the boat to the chosen destination. The notion of the teacher being a "knowledge navigator" may be useful to us in trying to define the role of the teacher in the classroom of the future.

Essentially, the role of the teacher must be to inspire the students. The teacher will achieve this by virtue of his or her own enthusiasm, creativity and vision. The teacher must also be able to demonstrate the ability to be a learner, and to be willing to set an example in taking learning risks. While the teacher will require some depth of knowledge of "content", more importantly, the teacher must also possess and use the skills required to access information on electronic networks, to make connections on the "telecommunications superhighways", and to then assemble, sort and process the information which is accessed.

The end result of this action is to enable the students to be their own "knowledge navigators", acting with increased autonomy and independence. The teacher becomes less of a curriculum "expert" and more a "designer" of learning experiences.

Such a vision will (and does) receive a mixed reaction from existing teachers and school administrators. A history of custom and practice in our schools makes such change difficult for even the most willing. Hierarchical departmental structures and rigid one-hour period timetables, strongly reinforced by the pressures of external examinations combine to create a considerable barrier to change. So how then can we make it happen? How can the existing culture of our schools be revamped to take account of the changes in the world around them? Some clues may be identified in considering a number of projects which are currently breaking new ground in the New Zealand education setting.

THE CASAtech PROJECT

New Zealand, like many other Western countries, has gone down the path of consolidating its small rural schools. Students are transported to larger, single institutions by bus or by car. The move is justified on the basis of economies of scale which give a better return for the investment in staff and buildings. In addition, changes associated with the introduction of Unit Standards and Sixth Form Certificate have made it difficult for small secondary schools to be able to provide the breadth of subject choices for their senior students, resulting in many of these young people leaving their home communities and moving to larger, urban centres to pursue their senior schooling. As more students leave, the school roll falls

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resulting in staff cuts, leading to fewer subject options being made available, and so the cycle continues. In addition to the impact on the schools involved, there has been a negative impact on the communities in which these schools exist.

The Canterbury Area School's Association Technology (CASAtech) project was developed in 1993 in response to this dilemma. By the beginning of 1994, seven Area Schools (catering for ages 5-17 years) were linked together using audio-graphic technologies to provide a "distributed classroom" for their senior students. In the project, a school with a teacher offering a course for which there were only two or three students enrolled, and which would normally therefore not run, could offer the course to students in other schools on the network, therefore forming a viable "class". The fact that this "class" was distributed among four or five other schools was unimportant, since the teacher and students were able to interact in their studies using the audio-graphic technologies at their disposal.

The equipment required at each site is not prohibitively expensive. The basic requirements include a desktop computer linked to the telephone network via a modem, a scanner, a printer and, perhaps, a light pen or graphics tablet. Some audio-graphic software, and an e-mail package together with an e-mail account with a local Internet provider will then provide the ability to "hook into" the network world. It is likely that in the near future a video camera may be added to the system, allowing the transmission of video images from computer to computer.

Not all of the learning takes place in the interactive audio-graphics environment, however. Many hours are spent negotiating meaning from print-based resources before and after each conference.

> **Already, many of our students come from homes which are more technology rich than their school classroom.**

Depending on the number of students involved at each site, this task may involve individual and peer activity. The conference itself becomes a time where views are clarified, arguments put forward, and ideas modified. Again, the role of the teacher has changed, from being the provider of information, to a manager of information and information access, and a designer of the learning experiences.

The CASAtech programme, as it became known, proved successful enough to proceed into its second year, and, in 1996, a further three secondary schools joined the cluster, giving birth to CANTAtech – the Canterbury Technology Schools Project. The success of the original CASAtech project, and the existence of similar needs elsewhere in New Zealand has led to other, similar clusters being established elsewhere in New Zealand. Advantages of the programme identified by principals and staff of the schools involved include providing students with the ability to take subjects of their choice at the senior level of the school where their only option previously may have been to consider moving to a school in a larger centre. Schools which faced the threat of losing staff, and even closure, are now remaining viable in terms of providing programmes at a senior level. Communities benefit from retaining individuals and families who otherwise may have moved away. Interestingly, for participating staff in those schools there is the opportunity for personal, professional development, and to have their expertise acknowledged in a broader context.

THE VIRTUAL CLASSROOM EXTENDS

As has been realised in some of the CASAtech schools, the advantage of this learning "infrastructure" has potential which extends beyond the realm of the formal classroom. Having put the necessary telecommunications technologies in place, the communities have been keen to use these networks to source other opportunities for learning. Farmers in the Oxford area have used the system to participate in agriculture courses provided by the Christchurch Polytechnic. Tai Poutini Polytechnic, Greymouth, has used a similar network on the West Coast of the South Island to provide a course in building and carpentry to senior high school students who are looking at moving on from high school to begin an apprenticeship in the building industry. This model lends itself very well to the many Industry Training Organisations (ITOs) looking to establish closer links and formal training opportunities for senior students at our high schools.

On a national scale, the *New Zealand Telelearning Network* has been established, working to achieve its vision of a network of sites covering the country, all of which are resourced with the necessary teleconferencing technologies, and connected to a national network via the telephone system. This network is aimed at co-ordinating links between existing clusters such as CASAtech and others, to provide the opportunity for people wherever they are in the country to gain access to learning opportunities, either formally or informally offered.

The scope for such a network is limitless, and, given the rate of advancement of such technologies, it is conceivable that such learning opportunities may become international, with learners from around the Pacific and beyond linked together for their classes. The use of such links is not restricted to providing "formal" schooling opportunities. Students may use them to pursue a particular research question, or to interact with someone from another culture in a more immediate manner than writing a letter, or reading about them in a text.

THE PITT ISLAND EXPERIENCE

The use of various telecommunications technologies linking classes of primary school children in Canterbury with the sole charge school on a tiny, remote island to the east of New Zealand helps illustrate this. Pitt Island is a small island with a population of less than fifty residents which forms a part of the Chatham Islands, some 350 kilometres east of Christchurch. As a part of a social studies project co-ordinated by staff of the Christchurch College of Education, three schools were linked to examine what it might be like to live where the other students lived. Besides the nine students on Pitt Island, there was a class from an urban Christchurch setting, and another from a rural Canterbury setting. Over a period of several days the students made contact using e-mail, fax and audio-conferencing. Their task was to produce a "newspaper" with a "slice of life" look at the other schools.

A unique glimpse of how the immediacy of the communication contributed to the learning occurred when one of the Pitt Island children was relating how he rode to school each morning on a four-wheeler motorbike, carrying a younger brother on the back. A pupil in Christchurch, intrigued that someone so young would be allowed to do such a thing, interrupted to ask whether this boy had ever had an accident. The response described an accident in which the younger brother broke a leg after the motorbike hit a sheep. The ensuing conversation generated a great deal of understanding about how people living in a remote island community cope with an emergency. Clearly, the immediacy of the questions and answers, and the fact that they were pupil owned and generated, made this learning experience more valuable than simply reading about it in a text.

In addition to the learner-generated questions which formed the basis of the

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newspaper research, a "formal" lesson was taken by a teacher in Christchurch which investigated the reasons for the difference in time between Pitt Island and Christchurch. This centred around a lesson on time zones in which pupils at various sites on the conference carried out experiments with globes and torches under the direction of the "remote" teacher with "on-site" parents and teachers participating also.

In the debriefing which followed the experience, those involved agreed that although similar learning opportunities could have been explored by using texts, photographs and local research, the dimension added by allowing real time interaction between the students contributed to a far greater breadth and depth of understanding. In addition, the high level of motivation of students was a significant feature of the programme.

IN-SERVICE TEACHER PROFESSIONAL DEVELOPMENT

Teacher professional development is another area where the notion of a distributed classroom is having an impact. Traditional methods of taking teachers out of schools for one or more days of training have proven expensive and time-consuming, with, in many cases, little or no real change being effected in the way a whole school operates. Thus, if the key teacher in a particular subject area leaves the school, someone else has to then go through the process of being trained. At a time where there is less money being made available for teacher development training, and where schools are being held increasingly accountable for the effective implementation of curriculum objectives, the gauntlet has been thrown down to explore alternative ways of effectively delivering teacher development training which succeeds in reaching a large number of teachers at a time, and which empowers schools to successfully develop and implement new programmes which meet the new curriculum requirements.

It is in response to this challenge that a programme of in-service teacher development was developed and implemented by the Christchurch College of Education. A programme of teacher professional development in Technology Education was trailled in 1994 as an Advanced Studies for Teachers (AST) paper, and expanded further in 1995 and 1996 as part of the Ministry-funded Teacher Professional Development contracts. A cluster of staff in participating schools work co-operatively in their school setting at a time which suits them during the week, then link with several other schools for a 30-minute audio-conference to share their conclusions and ask questions where appropriate. Not only does this method of delivery have advantages in terms of time and travel, but the increased degree of "ownership" at the school level results in the development of a school implementation plan which is well researched and specific to the school concerned.

PRE-SERVICE TEACHER EDUCATION

Pre-service teacher education is also moving into the distributed classroom in an effort to address the needs of students who, for many personal, family or financial reasons are unable to attend the college on a full-time basis. In 1995 the Christchurch College of Education launched its Primary Open Learning Option (POLO) – a distance education programme designed to maximise the use of traditional distance education methodologies (that is, print-based, audio and video material) as well as interactive telecommunications in both the formal course delivery, and in the area of supporting students in their study. The use of the term Open Learning in the title is an effort to communicate the fact that this programme has been designed to provide an alternative pathway for students to achieve their Diploma of Teaching. A flexible approach has been deliberately built in so that students who begin their course at a distance may transfer on campus at a later stage, and vice-versa. As the programme is developed and refined, every effort will be made to ensure that this "open" aspect is maintained as a prime focus.

SUMMARY

As the lessons learned and evaluations of similar projects from around the world become more widely shared, and as the technology continues to improve and become more affordable, I believe the "Distributed Classroom" will increasingly be seen as part of our education system. A word of warning, however. Our motivation for doing so should not come from the desire to find a use for the "gadgets" at out disposal, nor simply because we feel we should be "keeping up", and to make our school look more attractive. Instead, we need to examine the basis of our pedagogical beliefs and behaviours, and make the necessary changes to ensure that we reflect a learner-centred approach to our task, and that we ourselves are active in the learning process. In this way we can be sure of participating in a purposeful and productive way in the classroom of the future.

NOTES

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This article is adapted from:

Wenmoth, D. (1996, January). *Learning in the distributed classroom.* Paper presented at the Biannual Conference of the New Zealand Administration Society, Christchurch, New Zealand.

The "Consultel report" is:

Buckrell, P., Hamilton-Williams, R., McAuley, K., Prebble, T., & Rajasingham, L. (1992). *Consultel report: The use of telecommunications technologies for the enhancement of educational services.* Wellington: Consultel Associates.

The "classroom of the future" is described on page 228 of:

Rajasingham, L. (1994). The classroom of the future. In *Distance education: Windows on the future conference proceedings.* Wellington: Correspondence School.

The factors effecting a student's vision of how he/she learns are from page 5 of:

Tate, O. (1993, March). *A vision of distance education in New Zealand.* Paper presented at the Inaugural Conference of Distance Education and Information and Communications Technology Providers, Wellington, New Zealand.

Predictions about education out side school are from:

Handy, C. (1995). *The age of Paradox.* Hutchinson London.

The education process as a negotiation of meaning is discussed in:

Shale, D. (1988). Toward a reconceptualisation of distance education. *The American Journal of Distance Education, 2* (3), 25-35.

For further reading on distance education, see:

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A beginner's guide to THE INTERNET

GRAHAM WAGNER
NEW ZEALAND COUNCIL FOR EDUCATIONAL RESEARCH

Many teachers will have heard of the so called superhighway to the Internet, but not as many as one might think have travelled down it. A recent New Zealand Council for Educational Research study in a sample of New Zealand schools indicated that 69 percent of teachers (at both primary and secondary level) have not been in any way associated with the Internet (Wagner, in press). The following introduction signposts how to access this powerful communication tool and database.

WHAT IS THE INTERNET?

In the 1960s the United States Department of Defence established the Internet as an experiment to decentralise their computer system in case of a Cold War Soviet nuclear strike. The Internet was a network of computers throughout the United States linked together so that if one computer failed, the rest could continue operating.

In their spare time the scientists running the project (called ARPANET after its funding agency, the Pentagon's Advanced Research Project Agency) used the network to share ideas about systems administration issues. Before long these "newsgroups" were sharing ideas about other topics of current interest. In the 1980s the National Science Foundation (NSF) bought into the network effectively taking over from the Defence Department which finally relinquished its involvement in the Internet in the early 1990s. With the introduction of the NSF, use of the Internet soon spread to universities and research institutes in the United States, then later the United Kingdom, Europe, and the rest of the world.

NEW ZEALAND INVOLVEMENT IN THE INTERNET

The Internet was first made available in New Zealand in the late 1980s, with some bridging finance funding from NASA. A national gateway at Waikato University was created to provide access to other universities. An early intermittent satellite link was replaced in 1992 by a fibre-optic cable connecting Waikato University to the NSF in the United States thus providing users with a reliable and fast link to the Internet. Now, in addition to the university network, there are other suppliers of access to the Internet some with their own direct links to the Internet. In fact, such is the demand for access in this country that it has been said New Zealand has the highest growth rate of Internet use in the world. As to how many people use the Internet (also called the Net) no one really knows. There have been estimates that by 1996 there would be over 30 million people accessing and "surfing on the Net" world wide. The real figures may never be known – suffice it to say that the sheer size of the Net is mind boggling and its usage growth rate is phenomenal.

HOW CAN THE INTERNET HELP MY SCHOOL?

Those teachers not using the Internet are in danger of missing out on a rich and varied source of information for teaching and learning purposes. The converted would go as far as to say they will be missing out on a rare telematic (telecommunications plus computers) experience. For instance, the Internet offers access to:

- prestigious library catalogues at universities around the world.

- the latest information on recent developments in a specific area of interest through newsgroups and electronic journals,
- virtual shopping,
- electronic newspapers, and
- weather maps.

Not only is information available as text for downloading onto one's own computer, but there is a wide range of multimedia information available in graphics, audio, and short moving pictures formats.

The Internet also offers New Zealand school students and staff immediate e-mail access to other schools and people all round world, which in itself is a very cheap form of communication not available elsewhere. Those still in doubt about the benefits of the Internet for schools should read Ann Trewern's (1996) article *What's in it for me and my students?* (see **Notes**).

HOW TO START

Getting onto the Internet may seem complicated at first for it requires not only the ability to use a range of information and communication technologies, but also a knowledge and understanding of what to do once access to the Internet has been achieved. Even so, with a little bit of help from those who are computer literate it should be possible for any school to set up a link to the Internet. It should be acknowledged that there will be a cost in equipment, facilities and on-line running expenses which are, however, not outside the means of the average school or individual enthusiast.

Before jumping on the bandwagon it is useful to be aware of the steps to be taken. This highlights the costs of going on-line – the human costs in terms of personal and classroom time, frustrations over the complexity of the system, dangers of tapping into an almost free communication system, as well as the dollar costs. Knowing what is involved also highlights some of the rewards that this adventure holds for those who pluck up the courage to have a go!

STEP 1

To get going ensure that the school has a suitable "dedicated" computer which is going to be available during the day and night for those who will want to use it to go on-line to the Internet. The computer should be at least an IBM compatible 386 or Macintosh LC, with at least 500 mega byte hard disk drive (HDD), running on Windows 3.1, or higher, with at least 4 MBs of RAM). It will need a modem (a small electronic machine that talks to the telephone line at a baud rate of at least 9 600 bits per second) and communications software (which tells the modem what is wanted in the way of information from another source, much in the same way that a fax machine works). The cost of this equipment and software can range between NZ$2000 and $4500 – the more you pay the more you get! It is possible, with advice, to make savings by downloading communications software free from open access users' bulletin boards, or by paying a small fee for a shareware copy from a software supplier or mail order firm. Some software is free for educational use.

STEP 2

The second step is to see that the computer is linked through the modem to the telephone line. Each school has to decide if it can afford (or justify the expense) of installing a separate line for the Internet connection; or use a shared line (say between the fax and Internet, in which case a toggle switch should be installed between the two machines to stop interference); or consider the organisation required if one telephone line needs to be used for everything (telephone, facsimile, audioconferencing, and computer modem). The ideal arrangement is to have a dedicated line just for Internet use alone, though in many cases the expense may not be justified.

STEP 3

If you haven't already identified a local computer expert to guide you through the technical steps, it would be advisable to do so now!

In order to actually access the Internet you will need to ensure that appropriate communications software (which has already been loaded into either the computer's hard disk or a floppy disk) is primed to work with the computer modem to dial (via the telephone line) into an Internet Service Provider (ISP).

If the school has access to the Internet via the Ministry of Education through SchoolsNet or some other free or subsidised service, then well and good. The offering that comes with that service may be no more than a text-only fare, but it will be sufficient for most school purposes. On the other hand if these options are not available, or you want access to the World Wide Web (WWW), then there are a number of commercial ISPs who will be more than happy to have your custom for a fee.

The following selection of ISPs can be accessed readily from most main centres or an 0800 number (which overcomes the problem of paying for a toll call just to connect to the ISP):

Compuserve Pacific	Nationwide 0800 number
IBM New Zealand	Auckland, Wellington and Christchurch numbers
ICONZ	Most main centres have numbers

GLOSSARY OF TERMS

Baud – A unit of data transmission speed often equivalent to bits per second

Bit – The smallest unit of information a computer can hold.

BPS – Abbreviation for bits per second.

Bulletin Board – Computer version of a physical bulletin board which allows users to access and download messages.

Browser – Software that enables the user to investigate databases (for example, *Mosaic* and *Netscape Navigator*).

Cache – Another name for store.

CPS – Characters per second.

Download – Copying and transferring a copy of a file from one computer to another.

FTP – Abbreviation for file transfer protocol.

Gateway – Link into the Internet.

Gopher – A menu-supported software tool to locate on-line resources.

HTTP – An abbreviation for hyper text transfer protocol, or a way to transfer hypertext documents on the WWW.

Hypertext – A system of linking documents by keywords or phrases.

IP – Abbreviation for Internet Protocol, the standard for controlling communications on the Internet.

IP address – A unique address assigned to a computer.

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Learning Link NZ	Nationwide 0800 number
PlaNet	Most main centres have numbers
Telecom Xtra	Nationwide 0800 number
Voyager	Nationwide 0800 number or local number

STEP 4

In arranging an Internet address (mailbox) with an ISP you will have been faced with two main options – the "Shell" account versus the "PPP" or "SLIP" account. A Shell account is designed for users to use the ISP's computer to send and receive e-mail and to undertake text-based applications and information. A PPP (or SLIP) account gives you full, and direct, access to e-mail and the World Wide Web (WWW), without going through a host computer. The Shell accounts are cheaper and adequate for most school purposes, though are becoming more scarce as not many ISPs now offer them. The more expensive PPP and SLIP accounts give greater freedom of use and access through the graphical features of the WWW.

Once connected, there will be a new computer language to master – the operating system used by the host computer, if you are using a Shell account, or the software commands if you are using your own PPP or SLIP account. There are also new addresses to find – personal e-mail addresses for people you wish to communicate with, and the addresses of databases, newsgroups, and Internet software programs. There are also Internet software tools available to help users find their way around the many and varied resources on the Internet.

With advice and practice, users will become familiar with such terms as: "e-mail", "gopher", "Archie", "ftp", "http", "telnet", "news", "WWW", and will learn to surf the Internet with graphical interface programs such as *Netscape Navigator* or *Mosaic*. The latter in particular can undertake searches for you and put you in touch with multimedia resources through an address looking something like these:

- http://www.ntt.jp/japan/
  (Japanese language school)
- gopher://gopher.cosn.org
  (Consortium for School Networking Internet developments)
- telnet://pac.cafl.org
  (ERIC search and question facility)
- ftp://mcrnext.cso.uiuc.edu
  (Gutenburg Project Archive)
- news://alt.education.research
  (Educational Research for Teachers)

For more information about selecting appropriate addresses to fit ISP accounts and one's particular needs refer to Merritt and Reynolds (1995) in the **Notes**.

STEP 5

Apart from the money involved in getting onto the Internet there are still a couple of matters which need to be borne in mind: the amount of time spent "on-line", and the amount of data (space) that you need on your own computer when you download textual data information or other kinds of data.

- **Time**: It can take quite a while to find an address and even longer to download information. Time costs money which, if it doesn't come out of what you have paid in monthly usage charges, is always costed separately. This extra cost per hour could be as low as $4.00 or as high as $7.00, depending upon the ISP and the "user package" you have. The point to bear in mind in terms of extra time used is that if you constantly find yourself running over your monthly time allotment then you will need to renegotiate a usage package with a bigger time allocation, or simply budget more money for extras.
- **Space:** It doesn't take long to fill a computer's storage memory. Downloading a graphical, audio or video clip, or a piece of "upgrade" software can use over one megabyte of memory on your hard disk. Some ISPs not only charge for time on-line but will also charge for the amount of information (bytes) downloaded. Hence, the so called "free" piece of software you see on someone's bulletin board may end up costing you. Furthermore, it may add pressure to an already overloaded hard drive.

STEP 6

A word of warning once you are on-line with an ISP: remember to sign off correctly after each session, especially if you see that you have run over the time you have allotted yourself! Each software package uses different exit modes, but make sure that you *do* disconnect your computer modem from the telephone (manually if necessary). You don't want to be charged by your ISP for using a telephone link after you have disconnected from an internal Internet source, but not from the ISP.

NAVIGATING AROUND THE INTERNET

There are a number of navigation tools for finding your way around the Internet. Ones that have already been mentioned are Electronic Mail (e-mail), telnet, http, gopher, and the World Wide Web (WWW). Brown & Ryba (1996) give more information on these tools, and the following as well:

- mailing lists (Listserv),
- chat facilities,
- MUD – an introduction to virtual reality.

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- bulletin board systems (BBS), and
- search engines (Veronica, Jughead, Archie, etc.).

Once you start using the Internet and the navigational tools available to get around you will experience something called "Net Culture":

> Expect the Internet to change your life and the ways in which you go about business and entertainment. Expect to meet people, find out things, be appalled and amazed. Expect to watch a lot less television. Expect your friends to complain that your phone is always busy (Merritt & Reynolds, 1995, p. 63).

Having entered the Net you will be expected to practise Netiquette which takes on a special meaning in schools where the Internet account is likely to be used by a number of people. Some useful guidelines on what is, and is not, acceptable "user behaviours" are given in White (1996), see **Notes**.

THE WIDER ISSUES

Because the Internet is largely an unrestricted domain of information and opportunities, there are certain implications for teachers and parents to consider before entering into the quite significant setting up and maintenance costs of an Internet address.

- **Censorship** is a concern for individuals as well as for governments, some of which (most notably the United States, Germany, Singapore, and mainland China) have attempted, or are currently attempting, to censor access by their people to some parts of the Net. There is a concern that pornography will be accessible to children as it has been in some cases in the past. Yet while the Net is extraordinarily difficult to quarantine, there are programs (*Net Nanny* and *Surfwatch* for the WWW and e-mail) which can be put in place by schools, for teachers and parents to ensure that their students do not have unlimited licence to see and use what the Web has to offer.
- **Copyright** and the Internet is a minefield. There are many unresolved copyright implications surrounding the use of Web pages, accessing copyright material through a Web server, and the caching or storing of such information (Wagner & Jacquiery, 1966). Plagiarism is a problem which teachers and students will have to watch out for, as they do in other information domains. The best way of dealing with this matter is to acknowledge all sources and promote good ethical practices in classroom work.
- **Equity**. It is argued by Keegan (1996) that for the Maori to have access to the Internet is to empower them as a people. This argument applies to all ethnic or minority groups, as well as girls in the classroom who may not have easy access to computers. There is a concern that the cost of accessing the Internet may be prohibitive for some schools where minority groups dominate the school population. In addition, because information technology (and connecting to the Internet) is expensive, it is all too easy to spend a lot of money on supporting the information technology curriculum at the expense of other subject areas.
- **Information quality**. The amount of information available on the Internet is enormous. Some of this information is valuable and of high quality and some has little, or no, value. If schools want to minimise time spent searching and sifting through data on the Internet then it pays to learn how to use search machines such as *Yahoo*, *Webcrawler* and *Lycos* to narrow down information being sought to what is manageable. It should be noted that the information available on the Net, in most cases, has *not* gone through the rigorous vetting process that academic journals and published books go through, hence the need for caution in using it.
- **Teacher education**. Briefings such as this paper and the like are no substitute for hands-on training with experts in the field. Using advanced information and communications technologies, and going on-line to the Internet, were not the sort of things that most teachers were trained to do when they underwent teacher training. Thought must be given to providing teachers with adequate training so that the teachers are able at least to keep up with their students. If the training includes a conceptual component then teachers will be better placed to deal with the issues that arise and ensure that sound educational principles dictate daily work when using the Internet.

FINAL WORD

This paper is an attempt not only to illustrate the potential of the Internet for schools, but also to highlight what is involved in going on-line. The steps outlined above are intended to be signposts, not the definitive guide to accessing the Internet. It is assumed that you will seek some expert assistance if you decide to set up an information and communication system and seek an Internet address. If you follow this path you should be amply rewarded, although it has to be acknowledged that in unravelling the complexity of the Internet comes other concerns of equal importance. In spite of such caveats the opportunities are limitless and the rewards well worth the effort.

NOTES

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He has been involved in a recent study of a sample of New Zealand schools and their use of the Internet:

Wagner, G. (in press).

For a history of the Internet and how it operates see page 11 of:

Merritt, D. & Reynolds, P. (1995). *Internet: A New Zealand user's guide. Auckland:* Penguin Books.

That New Zealand has the highest growth rates of Internet use in the world is from page 20 of:

Brown, M. & Ryba, K. (1996). The information superhighway: A teacher's guide to the Internet. In Kwok-Wing Lai, (Ed.). *Words have wings.* Dunedin: University of Otago Press.

The estimates of numbers of people accessing the Net are from:

LaQuey, T. (1994). *The Internet companion.* Reading, Massachusetts: Addison-Wesley Publishing.

That the Internet is arguably the best archive of world history is quoted from page 21 of:

Brown & Ryba (1996), see above.

For general background reading see:

Lai, Kwok-Wing, (Ed.). (1996). *Words have wings.* Dunedin: University of Otago Press.

The benefits of Internet for schools are described by:

Trewern, A. (1996). The Internet: What's in it for me and my students? In Kwok-Wing Lai (Ed.). *Words have wings.* Dunedin: University of Otago Press.

The issues involved in getting onto the Internet are noted by:

Wagner, G. & Jaquiery, E. (1996). Distance education, multimedia and the Internet. In Livingstone, I. (Ed.). *New Zealand Annual Review of Education.* Wellington: Faculty of Education, Victoria University of Wellington.

Lai, Kwok-Wing, (Ed.) (1996), see above.

For details about selecting appropriate addresses and for a description of Net culture, see:

Merritt & Reynolds (1995), see above.

Guidelines for acceptable "user behaviours" are given in:

White, J. (1996). The Internet: Ethical issues for teachers. In Kwok-Wing Lai, (Ed.). *Words have wings.* Dunedin: University of Otago Press.

Censorship is discussed in:

Wagner & Jaquiery (1996), see above.

White, J. (1996), see above.

Maori access to the Internet is researched by:

Keegan, P. (1996). Initiatives in Maori networking. In the *Proceedings of the Computers in Education Society 6th Biennial Conference 1996.* 14-17 January, pp. 35-51.

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PARENT AND TEACHER RELATIONSHIPS

[illegible]

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Positive parent-teacher communication is a vital key in determining the learning outcomes of children in schools. The self-esteem, self-discipline, mental health and long-term aspirations of children have all been shown to be affected by family endorsement of school. Planned parental involvement has been associated with better language and motor skill development and improved conceptual development and problem solving.

When it comes to involving parents in schools, the beliefs and practices of classroom teachers are pivotal. Research carried out in the 1970s and 1980s underlined the importance of teachers. At the same time, the research was critical of school systems that failed to involve parents and community in the life of the school. One report suggested that schools were becoming increasingly isolated from the communities in which they are situated.

Recently, schools have been under increased pressure from external sources such as government and industry to implement major curriculum changes. Parental concerns have been fuelled by such calls for changes in schools. Parents strive to ensure that they provide the best educational opportunities for their children. Increased retention rates in the post-compulsory years and reduced youth employment opportunities have heightened traditional parental concerns about their children's future. Such concerns are evidenced at all year levels. Parents are looking to schools, and particularly class teachers, to support them in their role as parents.

It is important that teachers and parents develop positive relationships if children are to get the best they can from their years at school. For many teachers, however, the prevailing view of parents is clouded by the traditional folklore of schools that sees parents as one of *them* rather than one of *us*. Many parents have also regarded themselves as on the other side of the fence. Is this how parents and teachers really see each other? To find out, a pilot study was undertaken with parents and teachers from primary and secondary Catholic schools in a coastal Australian town. Information was gained from parents and teachers through a survey and interviews. Although this study was undertaken with a small group of teachers and parents, the views they present offer insights to parent and teacher perceptions about each other. This article discusses what each group believes about the other and examines the implications for parent-teacher communication for classroom teachers.

THE SCHOOL COMMUNITY

The research involved a sample of teachers and parents from six Catholic parish schools – three primary and three campuses of a secondary school – in a provincial, coastal town, from May 1994 to December 1995. The teaching experience of the 33 teachers who volunteered for the project ranged from six years to over 20 years across diverse settings in Australia and overseas and covered years K through to 12 (ages 5 to 17). Parents represented a broad cross-section of experience, from having their first child just starting at school to their youngest child in year 12. The employment status of parents also varied greatly. There were 240 parents in the sample drawn by a random selection from families with children in years K, 2, 6, 7, 10, 11, and 12.

THE STUDY

A modified form of the *Home School Communication Survey* developed by Heleen and Krasnow (1992), was used to gather data on parent and teacher beliefs and practices related to parent-teacher relationships. There were 45 items on the survey. Particular items focused on:

- beliefs about parent-teacher relationships (items 1-7),
- confidence in teachers or parents (items 8-16), and
- issues of communication (items 17-45).

Each item contained a statement to which respondents were required to indicate either agreement, importance or comfort. Surveys to parents and teachers also included an open ended request to identify examples of parent-teacher communication that they have found to be positive. Of the 529 surveys distributed to parents there were 240 replies. Parents and teachers were invited individually to face-to-face interviews based on the survey with the researcher. Focus groups for parents attracted 56 willing to share their thoughts about parent-teacher communication.

Responses to the survey were analysed and interviews transcribed. Key findings from the first two sections of the survey (items 1-16) which related to perceptions and beliefs about parents and teachers are discussed below.

PARENT-TEACHER RELATIONSHIPS [ITEMS 1 TO 7]

The results for these items, with the percentages of parents and teachers who gave each of the four responses, are displayed in Table 1.

Parents and teachers showed strong agreement on item 6, *Students learn the most when parents and teachers work together*, which was supported or supported strongly by 100 percent of teachers and 93 percent of parents. Similarly with item 2, *Students learn the most when parents and teachers have mutually agreed upon goals for education*, 84 percent of parents were in agreement and 92 percent of teachers.

However, although parents and teachers believe in the importance of mutually agreed upon goals (item 2), they differed in their perceptions about whether they actually *have* the same educational goals. For 71 percent of parents item 5, *Parents and teachers have different educational goals*, was negatively scored. That is to say, these parents believed that parents and teachers *do* have the same goals. On the other hand, teachers were divided in their responses with 42 percent disagreeing on this item (and therefore believe they have the same goals) and 58 percent in agreement that parents and teachers perceive educational goals differently. It would be fair to say that teachers were almost evenly divided in their perception about having common goals with parents.

Other statements were also viewed differently by teachers and parents. That *Information from school fails to inform parents about school programs and students progress* was agreed to by 60 percent of teachers but only 22 percent of parents. Therefore parents' perceptions of information from schools was more positive than that of teachers. This was supported with many examples given by parents both in the interviews and the open ended question related to examples on the survey.

The importance of teachers involving parents was agreed to by the majority of teachers and parents as shown in responses to item 7, *Teachers have enough work to do without having to involve parents.* While the majority of teachers (68 percent) disagreed with this negatively worded statement, and therefore affirmed the importance of involving parents, there was also some concern held by 32 percent of teachers. The parents responded with a slightly larger percentage (77 percent) disagreeing (and therefore supporting the role of teachers in involving parents) and only 23 percent believing teachers have enough to do without making time for parents. Parents as a group were more strongly of the belief that involving parents is a part of a teacher's work.

Parents and teachers were both in strong agreement the part of teachers' work involved helping parents *learn specific ways to help their child at home* (item 4). One parent related parental needs in this area to the changes that have occurred in school curriculum:

> Parents should be retaught how things are taught in schools, like phonics etc. Also with mathematics, the way we borrow and subtract, it's not like that any more.

WHAT IS IMPORTANT ABOUT PARENT-TEACHER RELATIONSHIPS?

Although the results above are based on a small sample of teachers and parents, it can be seen that the significant issues which arose related to shared goals, school communication, and teachers' role in involving parents. Parents and teachers on the whole share the belief that children learn best when there are agreed goals and co-operation between parents and teachers. This provides a strong basis on which to build positive parent and teacher relationships.

Parents and teachers each have vital roles to play in the education of children of all ages.

TABLE 1 PERCEPTIONS ABOUT PARENTS AND TEACHERS

	SURVEY STATEMENTS	RESPONSES							
		% STRONGLY AGREE		% AGREE		% DISAGREE		% STRONGLY DISAGREE	
		PARENTS	TEACHERS	PARENTS	TEACHERS	PARENTS	TEACHERS	PARENTS	TEACHERS
1.	Parents and teachers should decide together what is taught in school.	12	12	54	64	31	20	3	4
2.	Students learn the most when parents and teachers have mutually agreed upon goals for their education.	30	19	54	73	16	8	0	0
3.	Information from school fails to inform parents about school programs and student's progress.	5	16	17	44	63	40	15	0
4.	Teachers should help parents learn specific ways to help their child at home.	28	19	58	62	12	15	2	4
5.	Parents and teachers have different education goals for students.	4	8	25	50	63	42	8	0
6.	Students learn the most when parents and teachers work together.	46	37	47	63	7	0	0	0
7.	Teachers have enough work to do without having to try to involve parents.	2	0	21	32	56	64	21	4

TABLE 2 PARENT-TEACHER CONFIDENCE

	SURVEY STATEMENTS		RESPONSES			
			% STRONGLY AGREE	% AGREE	% DISAGREE	% STRONGLY DISAGREE
8.	I am confident that the teachers of my child: are doing a good job in teaching my child academic skills.	Parents	26	66	7	1
	I am confident that the parents of my students: are doing a good job in helping their children learn academic subjects at home.	Teachers	7	44	44	5
9.	... teachers ...: respect me as a competent parent.	Parents	20	74	5	1
	... parents ...: respect me as a competent teacher.	Teachers	15	81	4	0
10.	... teachers ...: care about my child.	Parents	29	66	4	4
	... parents ...: care about their children.	Teachers	54	46	0	0
11.	... teachers ...: are doing a good job helping my child resolve conflicts with peers.	Parents	9	70	19	1
	... parents ...: are doing a good job helping their children resolve conflicts with peers.	Teachers	8	50	42	0
12.	... teachers ...: are doing a good job encouraging my child's sense of self-esteem.	Parents	21	64	12	3
	... parents ...: are doing a good job in encouraging their children's self-esteem.	Teachers	8	77	15	0
13.	... teachers ...: are doing a good job in encouraging my child to have a positive attitude towards learning.	Parents	20	68	9	3
	... parents ...: are doing a good job in encouraging their children to have positive attitudes towards learning.	Teachers	8	81	11	0
14.	... teachers ...: are doing a good job encouraging my participation in my child's education.	Parents	10	65	24	1
	... parents ...: are doing a good job in participating in their children's education.	Teachers	8	52	40	0
15.	... teachers ...: are doing a good job in disciplining my child.	Parents	17	74	8	1
	... parents ...: are doing a good job in disciplining their children.	Teachers	8	62	30	0
16.	... teachers ...: are teaching my child to be a good citizen.	Parents	24	69	6	1
	... parents ...: are doing a good job in helping their children understand moral and ethical responsibilities.	Teachers	8	59	33	0

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As children progress through the school system, those roles change and the locus of knowledge about what happens at school changes in favour of the teachers. As shown above (item 4), teachers have a vital part in aiding parents understanding of current curriculum practices. Much of what occurs in schools carries with it implicit understandings that need to be explained to parents to create a base of shared understandings on which open parent-teacher communication can develop.

Although the survey results suggest a high level of parent satisfaction with the information about student progress, some parents, particularly of children in primary school, reported in the interviews that there was room for improvement in this area of communication. There was a feeling that teachers differed from the parents in how they viewed the children's work.

At high school level parents reported difficulties in gaining a total picture of their child's position in the school. Since parents have to communicate with a number of different teachers, it is often not until the parent-teacher interview that they find out that their child has problems. Students in secondary schools are encouraged to run their own lives as far as school work is concerned. This created dilemmas for parents, and also difficulties, for it was often up to the parent to put together the pieces of the puzzle about their child as a secondary student.

Hence parent-teacher relationships and communication become important for parents. Whilst parent-teacher nights provide formal opportunities for discussions with teachers, parents reported these were often clouded with the tension of concerns for children, too little time allocated for discussions and inadequate time management of the [illegible]. One parent put it this way:

> You sign your name for four appointments and then find one teacher will take forever with another parent, and you know if you leave to go to another teacher, you lose you place and won't get to talk to them.

Perhaps the perception by teachers that parents have different goals is reflected in the way in which they communicate with parents through situations such as parent-teacher interviews. It could be that changes in communication, resulting in closer contact with parents, may give teachers insights to parental goals. Parents were particularly vocal in their affirmation of teachers who *make time* for parents despite the demands of work and personal and family life on teachers' time:

> She rang me up to talk about him. I really appreciated her taking the time, because it was after all, after school.

The results from the first part of the survey have identified some similarities and some significant differences in the ways in which parents and teachers see parent-teacher relationships. If these relationships are to have positive outcomes, they need to be based on mutual respect, trust and shared understandings. Is this how parents and teachers see each other?

PARENT-TEACHER CONFIDENCE [ITEMS 8-16]

These items primarily sought to determine the confidence that teachers hold about parents and vice versa across a range of topics related to their roles. This section of the survey was a set of nine statements which all followed the same sentence stem. On the teachers' survey the stem began *I am confident that the parents of my students...* and on the parents' survey the stem was *I am confident that the teachers of my child....* Table 2 shows these statements with the percentages of parents and teachers who gave each of the four responses from strongly agree (1) to strongly disagree (4).

Parent and teacher responses for these items varied with four items reflecting mutual confidence, three items showed very high parental confidence and varying teacher confidence, and two items reasonable confidence. Responses to items 10 (*care about children*), 12 (*self-esteem*) and 13 (*positive attitudes to learning*) indicated very high agreement between teachers and parents in expressing confidence of the other's ability in their roles. Teachers were 100 percent confident that parents cared for their children. They were also supportive of *parents doing a good job in encouraging children to have positive attitudes towards learning* (89 percent). Parents were correspondingly confident that teachers cared about their children and encouraged their learning habits. Both parents and teachers were confident that they were respected in their roles by each other (item 9). Results on other items suggest that although parents are confident that teachers respect them as competent parents, there appear to be some areas of concern by teachers about parents' abilities.

Parents were found to be highly confident of teachers in the areas of *teaching academic skills* (item 8, 92 percent), *discipline* (item 15, 91 percent) and *developing good citizens* (item 16, 93 percent). However, teachers were not able to agree about parents' abilities, with 51 percent believing that *parents are doing a good job in helping their children learn academic subjects at home* and 49 percent believing that they don't. This was reinforced through the interviews with some comments like the following: "Parents leave it to us to do the academic stuff."

Teacher confidence in parents *disciplining their children* (item 15, 70 percent) and helping them learn *conflict resolution* (item 11) was also significantly different from how parents perceive teachers. One secondary teacher, commenting on the problems with discipline that parents can face, said "Parents lose sight of teenagers' needs."

Participation (item 14) was an area in which some teachers held low confidence in parents (40 percent) and others felt confident (60 percent). Some teachers reported: "Home-school communication between parents and teachers is drastically missing at this moment." Parents also voiced some concerns in the interviews about how teachers perceived parents. In relation to parent participation, one parent said, "They think you're not interested if you don't go."

WHY IS PARENT AND TEACHER CONFIDENCE IMPORTANT?

Parents and teachers hold each other in high regard as people who care about children. There is a strong confidence that each is respected by the other. Three out of four parents have confidence in teachers in *all* the areas addressed in the statements. However, teacher confidence fluctuated particularly in parents' ability to help their children at home in academic areas and conflict resolution. The positive responses from the majority of parents could indicate that although teachers lack confidence in parents, they do not express this to parents.

Teachers in many schools, particularly Catholic schools like those in this study, operate under explicit and implicit expectations that parents are a vital part of the school. The teachers in this survey were able to convey this to parents. Discussions with parents revealed that they were very grateful to teachers who made an effort to communicate with parents through reports, newsletters and phone calls. Parents support and have time for teachers and felt supported by the teachers. One parent spoke for many when she described the philosophy of one school toward parents:

> It's a philosophy that says individual treatment and respect. Respect is one of the words that I would use to differentiate between school systems. Respect of kids, of teachers, parents of teachers, teachers of parents. One of the joys of this system is the immediate accessibility of teachers. You go away feeling that something will be done.

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IMPLICATIONS FOR TEACHERS

IT'S A MATTER OF TIME

Differences in perceptions between parents and teachers have significant implications for teachers working with parents. Whatever level the classroom, the pivotal factor in working with parents is respect and understanding. It has been shown above that teachers *have time* for parents. That is to say they are disposed positively towards parents as carers of their children and, up to a point, as collaborators with teachers in education and learning. However teachers believe that parents have goals for their children which are different from those held by the teachers. This manifests in a lack of confidence in parents in areas of concern to teachers such as helping children learn academic subjects and conflict resolution at home.

The most important implication for teachers is that they need to establish clear understandings between themselves and parents. Before undertaking any efforts to involve parents, teachers need to find out what parents think, what their goals and expectations are.

It is also important that teachers *make time* for parents. They need to make time to communicate with parents about what happens in classes and time to get to know parents on an informal basis. Strategies that teachers in this research found effective are:

- weekly class newsletters outlining current class work, interesting information, and upcoming events and topics;
- phone calls to discuss children's good behaviour and achievements rather than only the bad behaviour;
- class or year level bar-b-ques or morning teas which offered parents the opportunity to meet other parents and the teacher/s in a non-threatening situation.

It is important in any relationship to have respect. The survey results clearly indicated that parents were more positive about teachers than teachers were of parents. Teachers need to develop positive attitudes about parents. Beliefs guide our actions and the beginning point in improved relationships for many could be simply regarding parents on the whole as people we have time for.

Teachers have varying responses in relation to the demands working with parents make on their professional skills. Often teachers feel unprepared for increased contact with parents. Typically teachers with an early childhood focus will have undertaken preservice studies related to families and home school community relationships whereas secondary teachers have had no formal introduction to the area. Therefore teachers at all levels may require professional development in the area of parent-teacher communication in order to develop practical strategies for fostering parent-teacher communication and increasing parental participation. Increased professional skills will therefore be developed over time.

CONCLUSION

Teachers for the most part value the role parents play in their children's education and recognise that the complex realities of parenting prescribe a range of roles for parents in schools. On the other side of the fence, parents show respect for teachers and have confidence in their abilities. If schools are to throw off the mantle of being parent-free areas, there needs to be serious decision-making at an administrative level to support teachers in school reform.

Although there are different perceptions held by parents and educators about parental involvement, when it comes to instigating participation teachers are the key. One critical factor in determining practices of parent-teacher relationships has been identified as teacher confidence. Challenges to teachers' professional self-image are occurring at an increasing rate as outside pressures impinge on their classrooms and on their time. The parents in this research have shown they have confidence in the teachers and have a strong belief in the importance of parent involvement with teachers. Teachers were less supportive of parents but are committed to the involvement of parents in the education of their children. If parents and teachers are to work together in partnership in schools then the next step is obvious, as one teacher said:

> We talk about each other. We should sit and talk together.

NOTES

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This article is based on the following papers which contain further discussion of the methodology used in this study:

Arthur, J. & Dorman, J. (1995, July). *Time for parents: A belief or practice?* Paper presented at the Australian Curriculum Studies Association (ACSA) Biennial Conference, Melbourne.

Arthur, J. & Bingham, R. (1994, December). *All at sea: A dissonance model of inservice.* Paper presented at the annual conference of the Australian Association for Research in Education, University of Newcastle.

Arthur, J., Bingham, R., Ireland, P.J., MacQueen, C. & Swain, N. (1994, December). *You didn't tell us what to do.* Paper presented at the annual conference of the Australian Association for Research in Education, University of Newcastle.

The value of positive home-school relationships has been reported by:

Greenberg, P. (1989). Parents as partners in young children's development and education: A new American fad? Why does it matter? *Young Children*, (May), 61-74.

Swick, K. J. & McNight, S. (1989). Characteristics of kindergarten teachers who promote parental involvement. *Early Childhood Research Quarterly*, *4*, 19-29.

The perceptions of teachers and parents have been researched by:

Power, T.J. (1985). Perceptions of competence: How parents and teachers view each other. *Psychology in the Schools*, *22* (January), 68-78.

Williams, D.L. (1991). Training teachers and administrators for parental involvement: Implications for public choice schools. *International Journal of Educational Research*, *15* (3/4), 339-352.

The identification of teachers as the key instigators of parental involvement as been shown by:

Hoover-Dempsey, K. V., Bassler, O.C., & Brissie, J.S. (1987). Parent involvement: Contributions of teacher efficacy, school socio-economic status, and other school characteristics. *American Educational Research Journal*, *24*(3), 417-435.

Swick, K. J. & McNight, S. (1989). Characteristics of kindergarten teachers who promote parental involvement. *Early Childhood Research Quarterly*, *4*, 19-29.

Research on the quality of parent-teacher relationships has been undertaken by:

Clark, M. (1988). *Children under five: Educational research and evidence.* London: Gordon & Breach.

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Pugh, G. (1988, September). *Parents and professionals [illegible] preschool services: Implications of [illegible]* Paper presented at the 18th National Conference AECA, Canberra.

Schools Council. (1990). *Australia's schools: The next decade.* Canberra: Australian Government Publishing Service.

The Home School Communication survey was reported by:

Heleen, O. & Krasnow, J.H. (1992, April). *Parent-teacher action research in the league of schools reaching out.* Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.

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EFFECTIVE
COMMUNICATION IN SCHOOLS
CAN A BUSINESS MODEL BE OF VALUE IN EDUCATION?

NICOLA BELSHAM

PATRICIA BERWICK, Wellington • IAN GRIEVE, Auckland

The process of a communication audit motivated the staff of a primary school in Christchurch, New Zealand, to strive to act as one unit to improve overall school communication. Communication is a two way process, however, and both sides, that is management and staff, learnt they needed equivalent knowledge to untangle the complexity of apparently simple messages.

THE SLIGO COMMUNICATION AUDIT is a proactive tool used by businesses to enable them to change the processes which cause communication blocks. Developed within New Zealand (by Dr Frank Sligo, Massey University, Department of Human Resource Management) for the New Zealand situation, it has a proven track record within the business world. It consists of a questionnaire framed in business language which, in the case of the school in this study, was administered to all staff and Board of Trustees (BOT) members: and an interview schedule which, in this case, was applied to 10 percent of the staff. The results are assessed both quantitatively and qualitatively. It enables divisions within an organisation to be compared and measured against one another for effective communication and highlights different problems experienced by various levels of staff. The results are statistically reliable and the recommendations are practical and soundly based on valid data. Because of the requirement for specific accountability within today's schools, and because of the recent and intractable communication difficulties experienced by some schools which have received considerable media attention in recent years, it seemed appropriate to trial such an audit in a school.

HAMMERSLEY PARK SCHOOL was chosen because it is a large school by primary school standards and is complex. It is made up of a regular contributing primary school (Year 0 to Year 6), a physical disabilities resource unit, and a teacher special needs unit. These separate entities are melded together to make up one school. The Physical Disabilities Resource Centre (PDRC) is both a metropolitan and regional resource centre for supporting physically disabled children with their educational needs. There is a core roll of children who require more intensive support before being transferred to their local school. There are 13 professional and support staff in this unit.

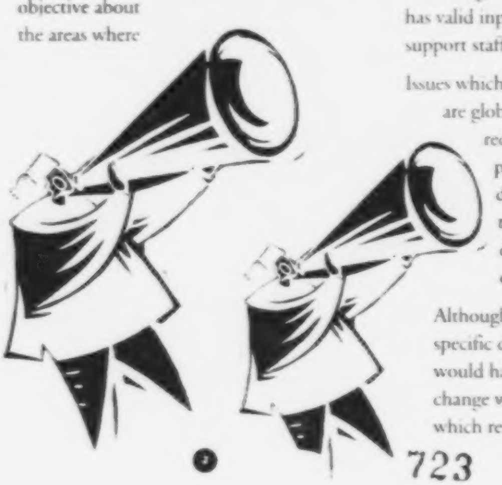
The Teacher Special Needs Unit (TSN) unit is a smaller unit of two teachers plus support staff. Similarly a small base-class is maintained while both teachers provide itinerant support for special needs children within a defined catchment area of north-east Christchurch.

THE PRINCIPAL'S VIEWPOINT

Following an approach from Trish Berwick in November 1993, it was agreed to trial the use of a business model to investigate information and communication practices.

In many ways Hammersley Park School is unique in that the success of the school programme hinges on the effective linkage and communication between teaching staff and therapists for disabled students. The school has 41 staff, including teachers, therapists, support staff, the Board of Trustees (BOT), and community allied support services like Special Education Services, Health Services and Social Welfare. There are only four similar primary schools within New Zealand.

I believe staff and BOT were aware of communication deficits in areas of the school, however in order to fulfil the goals and objectives of the school as defined in its charter, I felt it was important to be able to be objective about the areas where communication was impaired. A communication audit would provide base-line data which would be fundamental to the modification and improvement of practices throughout the school with staff and BOT taking ownership of the communication process.



Following the communication audit in December 1993, the school suffered an arson attack in which one whole wing of the Physical Disabilities Resource Centre (PDRC) was razed, destroying records and resources accumulated over nearly fifty years. In terms of the school community the combination of the fire and the audit proved to be catalysts in triggering an unplanned team-building exercise in which *communication* was the beneficiary.

Previous lines of demarcation disappeared as staff, parents, trustees, and support agencies, for example, the Ministry of Education, struggled collectively to piece together the remains of the unit and prepared a strategic plan for term 1, 1994, whereby the school's programme could commence with minimal disruption to children.

That this was achieved reflected a significant short-term gain in the effectiveness of communication. Such gains have been capitalised upon through reviewing and building alternative strategies in addressing some of the issues raised in the survey.

One of the alternative strategies developed was the use of quality learning circles (a term borrowed from Total Quality Management) to improve inter-departmental communication. The circles – short, sharp topic-based meetings linked to the school's strategic plan which are reported back to the whole staff – are transdisciplinary so when discussing any issue each sector of the school has valid input from teachers, therapists and support staff.

Issues which have been addressed in this way are global, for example, budgetary or the redevelopment of the school playground. Communication developed using this format served to inform as well as achieve decisions – decisions which are owned by all.

Although the audit had highlighted specific communication problems it would have been difficult to have created a change without the team-building process which resulted from the cataclysmic effect of the fire. Thus, a communication audit is possibly most effective when conducted hand-in-hand with a planned team-building programme.

THE CONSULTANT'S VIEWPOINT

At a time when the value of management systems within education, like Total Quality Management, is being questioned by such knowledgable people as Dr Hinchcliff of Auckland Institute of Technology, it is useful to evaluate the effects the communication audit on the school communication structures.

Not all schools see themselves as businesses. Systems applicable to business practices often appear inappropriate and unmanageable within a school. However, this does not mean that a tool used to clarify specific processes within the business world cannot be applied and adapted to be effective within a school, particularly in an environment where schools are being asked to utilise a business model. There has been no comparable tool developed to assess communication within education in New Zealand and true accountability requires some method evaluating this process. Because the Sligo method had been developed for New Zealand business and had proved to be successful within that environment a test of this communication audit was feasible.

Did the audit find anything the school did not already know about its communication? What did the results look like for Hammersley Park School?

THE RESULTS

The results showed Hammersley Park School to be an exceptionally friendly and open school and yet there were obvious signs of communication difficulties.

Many comments in the interview schedule about working conditions were similar to the following:

> [I like] the variety of staff and variety of their occupations. The friendliness of the staff: there's a lot of fun which goes on.

When asked what they disliked about their working conditions many stated that dislike was too strong a word. For example:

> Dislike is probably too strong. I feel a lot of the time we are dealing with problems about which we don't have control, problems like absenteeism

The school had a notable difficulty in that it appeared, from the outside at least, to have the possibility of being three facilities within one school. That is, the Physical Disabilities Resource Centre (PDRC) and the Teacher Special Needs Unit (TSN), and the regular contributing primary operated as one school in some instances but in most communication structures and needs, the information was different within each area. In addition to this structural complexity, there was the vertical management system common in all schools which meant some information did not "filter down" to the classroom teachers and support staff. This was especially true for part-time personnel.

Much of the communication difficulty was seen in the following light:

> Since it's such a large school it [information] sometimes takes a lot of time [to reach me]. Information can become stopped or waylaid. The layout of [the school] is horrendous.

It was apparent many systems had been tried to ensure that good communication occurred (for example, staffroom notebooks, altered staff meeting styles, white boards). Several staff-members made statements like:

> We have tried a number of things [to improve communication] but it didn't help For example, a book where people recorded [their news] in it. But it was an intrusion [into classroom practice when it was brought around].

Most of the necessary information did in fact reach those who needed it. There were however some differences of opinion among staff about what they thought they needed to receive, especially in relation to work performance and assessment and in the wellbeing of the school as a whole. The staff's interest in these areas arose from interest in promotions and through strong loyalty ties to the school.

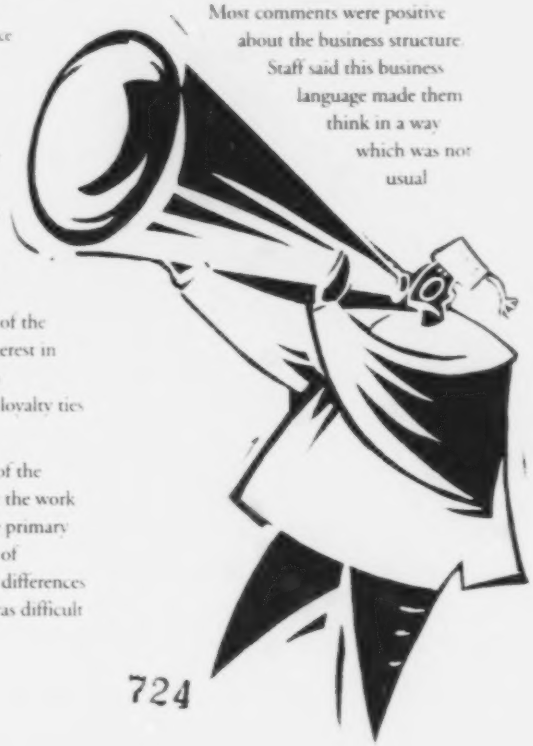
One problem was that the staff of the PDRC didn't know much about the work and workloads of the staff of the primary school, and vice versa. This lack of recognition of the structure and differences of workloads within each unit was difficult to overcome because of the wide variety of professions (for example, therapists, teachers, support staff). The results showed the communication structures were different in each area because of the differing functions each of these professionals carried out in relation to the children.

Perhaps the most interesting, if not surprising, finding was the staff's commitment to *gossip* or *informal gatherings* as a preferred source of effective communication. These were felt to be low-key ways of being well informed. It was also felt that it would be well worth regenerating a *grapevine* [daily printed messages relayed to teachers in their classrooms] or a setting up a series of short, unstructured, meetings in small groups.

STAFF PERCEPTION OF THE AUDIT

It must be noted that the timing of this audit was not the optimum time for any investigation of a school. The data gathering took place in the last four weeks of the school year. The principal has to be applauded for the job he did of selling the audit (which was structured in business language which was difficult for the staff to accommodate with little preparation) to the staff at such a time.

Most comments were positive about the business structure. Staff said this business language made them think in a way which was not usual



within a school. This process appeared to help many staff to clarify the problems at hand. One staff-member said, however:

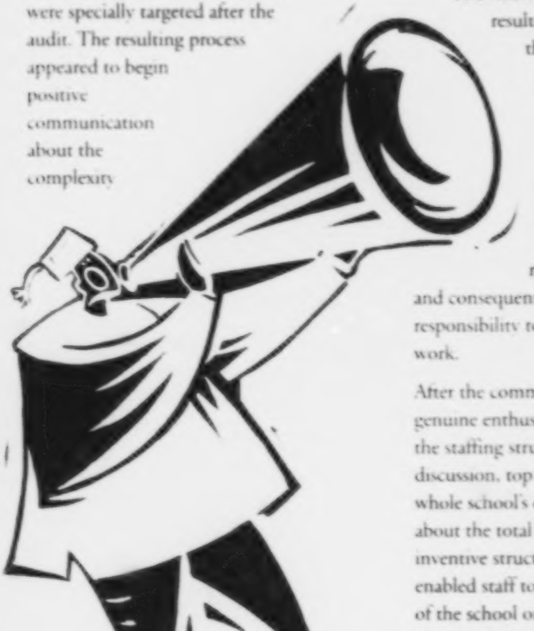
> [The questionnaire was] difficult. I probably found the business model quite difficult to relate to here. The wording. I probably don't think of myself as middle management.

It says a great deal for the co-operative environment of this school that everyone could pull together at such a time, when many different events were happening, and to show the enthusiasm they did for the process. All members of staff were happy to debate the issues discussed in the interviews or the topics from the questionnaires. At no time did the researcher feel any unwillingness to participate or co-operate.

WHAT HAS HAPPENED SINCE THEN?

The Sligo Communication Audit proved effective in clarifying pathways of communication and in initiating improvement. So, this audit provided a gateway to improved communication.

The difficulties within the staff dynamics, particularly transdisciplinary information sharing/priorities and interdepartmental communication, had been known to the school prior to the audit but they were specially targeted after the audit. The resulting process appeared to begin positive communication about the complexity of the staff dynamics. The principal stated that the audit helped the staff to acknowledge this communication barrier and to work on it positively.



The fire of January 1994, which destroyed much of a building and irreplaceable resources and records accumulated over many years, caused the unplanned team-building exercise which focused the results of the communication audit and enabled management and staff to recognise their joint responsibilities in the total running of the school.

It is hypothesised that the communication audit would not have been an effective tool without this catalytic team-building event. Conversely, the fire alone would not have created the co-operative working environment which has occurred since then. It seems a communication audit is insufficient on its own to be effective. A planned team-building exercise is also essential.

Today the staff dynamics are considerably improved. Some of this may be due to changes in staff positions. However, the major significant factors appear to be the staff discussions which resulted from the communication audit and the fire. These joined together to contribute to communication system's reorganisation.

The structure of the meetings which has resulted is specific to the culture of this school with its particular mix of networks and personalities. It is hypothesised that this structure would not have worked if it had have been imposed or even suggested by management. Staff and management feel ownership and consequently are taking joint responsibility to make the new structure work.

After the communication audit and the fire a genuine enthusiasm to discuss a reshuffle of the staffing structure had taken place. In this discussion, top management took note of the whole school's desire to be informed on topics about the total running of the school. An inventive structure has arisen which has enabled staff to know the basic running costs of the school on a day-to-day basis. This knowledge has helped staff to understand top management decisions more clearly.

HOW WAS THIS ACHIEVED?

Apart from the usual syndicate meetings and teacher development meetings on curriculum issues, the usual staff meeting was replaced by quality learning circles. The beauty of these short, sharp meetings is that they are interdisciplinary and small. They have all the information necessary to have a productive discussion and to reach reasonable decisions.

The end result has been that the staff and Board of Trustees are taking ownership of the school's priorities.

Through the process of the application of the communication audit the staff were able to express their opinions about both the good and the bad communication strategies employed within the school. This lead to discussion and healthy debate about these strategies. The fire provided an unplanned, dramatic, team-building exercise which appeared to crystallise the need for co-operation. Staff and management began to understand each other's perspectives and a co-operative solution has been found. Today both management and staff are able to take ownership of their part in major communication issues through a number of ways, in particular, through the vehicle of the quality learning circle.

NOTES

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The communication audit and this article were completed with the support of the BOT and staff while he was principal of Hammersley Park School.

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For more details of the Sligo Communication Audit contact Dr Frank Sligo, Department of Human Resource Management, Massey University, Palmerston North, New Zealand or Dr Patricia Berwick, P O Box 1108, Wellington, New Zealand.

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INVOLVING PARENTS IN ASSESSMENT:

THE HOME-SCHOOL PARTNERSHIP IN RECORDING PROGRESS

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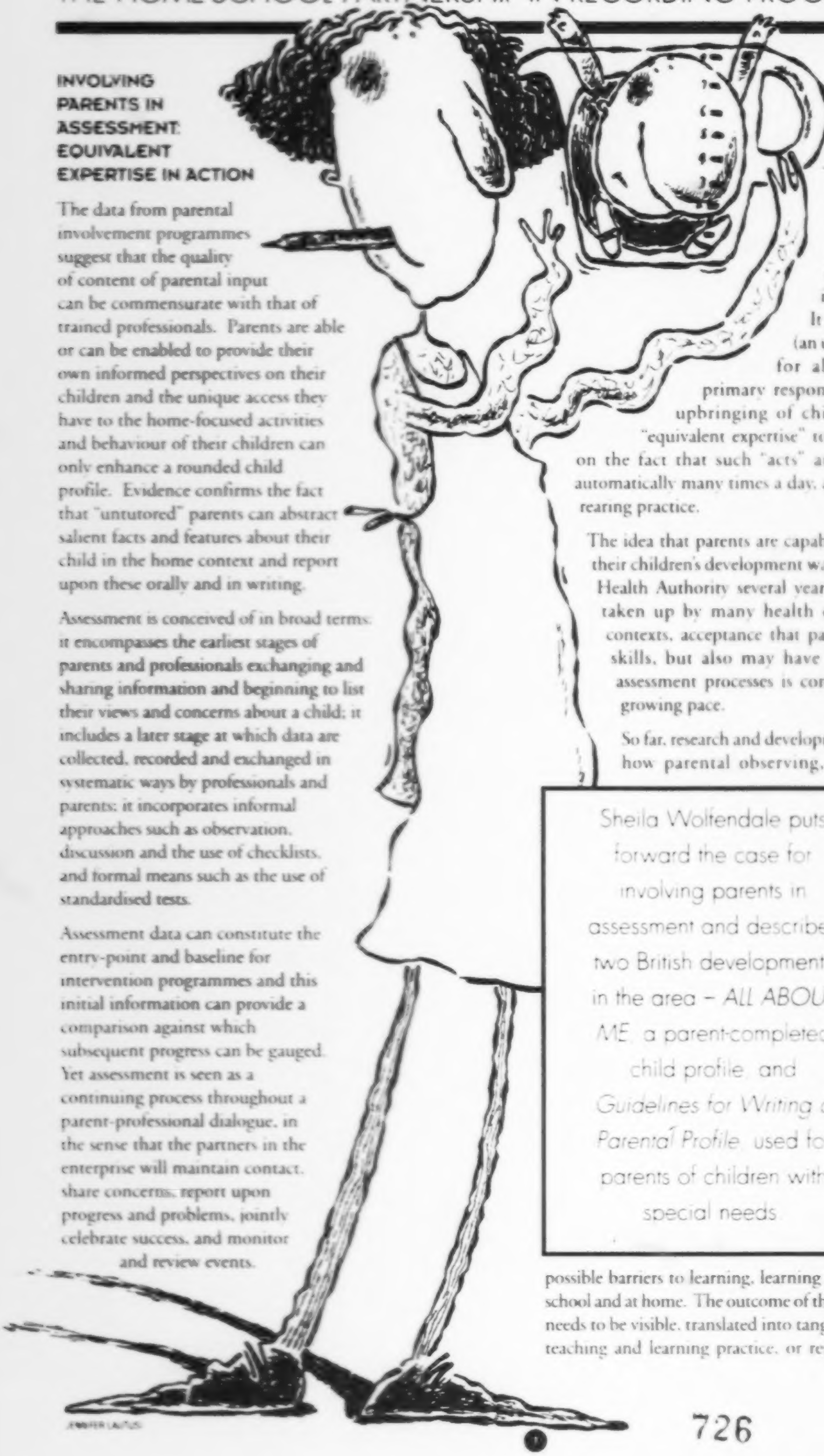


JENNIFER LAUTUS

INVOLVING PARENTS IN ASSESSMENT: EQUIVALENT EXPERTISE IN ACTION

The data from parental involvement programmes suggest that the quality of content of parental input can be commensurate with that of trained professionals. Parents are able or can be enabled to provide their own informed perspectives on their children and the unique access they have to the home-focused activities and behaviour of their children can only enhance a rounded child profile. Evidence confirms the fact that "untutored" parents can abstract salient facts and features about their child in the home context and report upon these orally and in writing.

Assessment is conceived of in broad terms: it encompasses the earliest stages of parents and professionals exchanging and sharing information and beginning to list their views and concerns about a child; it includes a later stage at which data are collected, recorded and exchanged in systematic ways by professionals and parents; it incorporates informal approaches such as observation, discussion and the use of checklists, and formal means such as the use of standardised tests.

Assessment data can constitute the entry-point and baseline for intervention programmes and this initial information can provide a comparison against which subsequent progress can be gauged. Yet assessment is seen as a continuing process throughout a parent-professional dialogue, in the sense that the partners in the enterprise will maintain contact, share concerns, report upon progress and problems, jointly celebrate success, and monitor and review events.

This view is particularly relevant to the burgeoning area of parental involvement in assessment. It presupposes that parents (an umbrella term in this article for all those who have the primary responsibility for the care and upbringing of children) contribute their "equivalent expertise" to acts of assessment based on the fact that such "acts" are carried out routinely, automatically many times a day, as an integral part of child rearing practice.

The idea that parents are capable of accurately recording their children's development was explored by Oxfordshire Health Authority several years ago, and has now been taken up by many health districts. In educational contexts, acceptance that parents not only have such skills, but also may have rights to participate in assessment processes is coming about at a slow but growing pace.

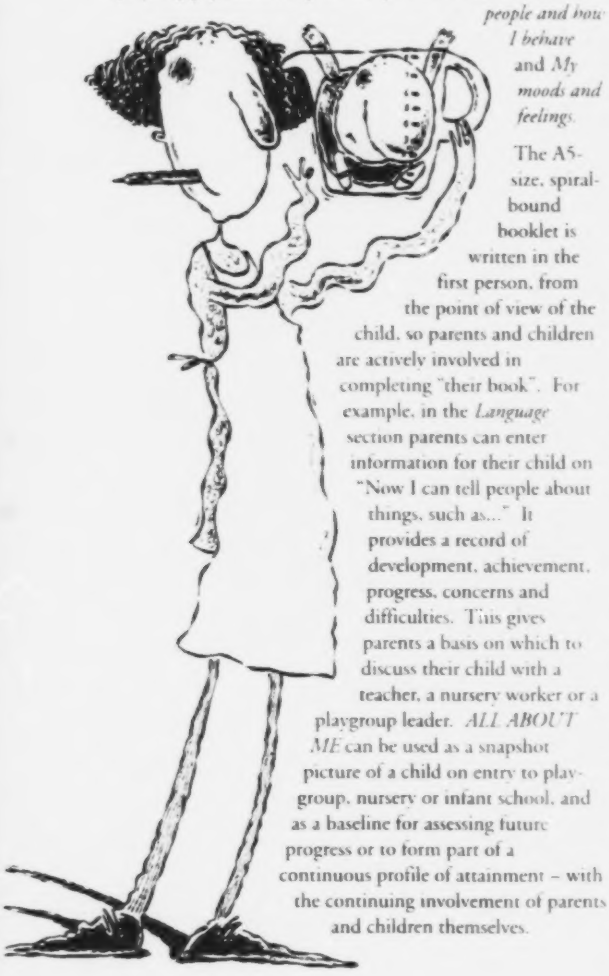
Sheila Wolfendale puts forward the case for involving parents in assessment and describes two British developments in the area – *ALL ABOUT ME*, a parent-completed child profile, and *Guidelines for Writing a Parental Profile*, used for parents of children with special needs.

So far, research and development have concentrated on how parental observing, predicting, describing, reporting and recording can be channelled most effectively towards a more formalised conception of assessment of the child and his/her educational progress. Ultimately, the child/young person must be seen to benefit from joint assessment ventures between teachers and parents – looking, perhaps, at current functioning, present achievements, possible barriers to learning, learning and development needs at school and at home. The outcome of this home-school partnership needs to be visible, translated into tangible affirmation of existing teaching and learning practice, or resulting in re-appraisal and change of practice. Even if home-based learning or behaviour-change programmes are not included in the learning equation, parents and the child need to have participated in the decision-making along with the teacher.

This author has been exploring the match between these theoretical premises and their applicability to educational practice for a number of years, particularly through the piloting and take-up of two assessment instruments developed for parental use in quite different contexts. This work will be briefly described and salient references given for readers who wish to follow this up in more detail.

ALL ABOUT ME

ALL ABOUT ME is a developmental assessment technique which places parents at the centre of the process. It is a booklet which can be filled in by parents to help build up a record of their child's progress in seven main areas of development until they are six years old. There are sections entitled *Language*, *Playing and learning*, *Doing things for myself*, *My physical development*, *My health and habits*, *Other people and how I behave* and *My moods and feelings*.



The A5-size, spiral-bound booklet is written in the first person, from the point of view of the child, so parents and children are actively involved in completing "their book". For example, in the *Language* section parents can enter information for their child on "Now I can tell people about things, such as..." It provides a record of development, achievement, progress, concerns and difficulties. This gives parents a basis on which to discuss their child with a teacher, a nursery worker or a playgroup leader. *ALL ABOUT ME* can be used as a snapshot picture of a child on entry to playgroup, nursery or infant school, and as a baseline for assessing future progress or to form part of a continuous profile of attainment – with the continuing involvement of parents and children themselves.

DEVELOPMENT

The booklet was developed in 1986 and has been tried out in a number of preschool and infant school settings in different parts of the country.

The London Borough of Bexley piloted its use as a part of developing a primary school record- keeping system which closely involved parents. A project in Newham looked at the usefulness of *ALL ABOUT ME* as an on-entry to school assessment approach and record of achievement.

Although *ALL ABOUT ME* has mainly been used in educational settings, it has also been used successfully in nurseries run by social services and by childminders. A study conducted to find out its relevance to childminders and parents of the children they look after found that it can be a useful tool in promoting the quality care of minded children. The study also found that parents of babies aged under one-year-old considered it appropriate for this age range.

ALL ABOUT ME is intended to provide a contribution towards the all-round assessment of young children by including the perspective of parents. It can complement assessment of progress by other early-years workers, and has also been perceived to have potential as a training guide on early development. It is intended to apply to all families and aims to be culturally sensitive to differences between families in matters to do with child rearing, child management and family customs. Local translations exist in Urdu and Bengali.

PARENTAL PROFILES

Another successful attempt at involving parents with the assessment of their children, in this case children with special needs, has resulted in the publication of specific *Guidelines for Writing a Parental Profile*.

The advent of the 1993 Education Act and the opportunity for parents to express their views ("parental advice") as part of the formal assessment process (Section 5 of the Act) highlighted the dearth of parental guidance mechanisms to assist them to take up this right. An attempt to redress this was made by this author and colleagues in a national pilot study, testing out the effectiveness of draft guidelines to assist parents to write a Parental Profile of their child which could be used as a parental assessment or "advice" in Section 5 assessment. The study confirmed that parents welcomed the provision of written guidance to help them to write profiles of their children, which could and should be as important a part of the formal assessment process as professional advice. One outcome of the study was to revise the draft guidelines. The *Guidelines for Writing a Parental Profile* cover: *The early years*, giving parents an opportunity to record early impressions and concerns (Part A); *What is your child like now?* (Part B), which lists eight key areas (communication, relationships, behaviour at home, playing and learning, general health, self-help, physical skills, and provides statements against each one to trigger relevant responses and provision of information); and *Your general views* (Part C) which asks nine questions to assist parents to summarise their views and feelings and formulate their concerns.

Following the study, many Local Education Authorities (LEAs) adopted the guidelines as part of their standard 1993 Education Act information to parents. An accumulating "portfolio" of evidence in LEAs is testimony to the fact that parents respond, often with relief, to the chance to describe their child and express their concerns and their views. Parents' comments can be directed about their child and, at the same time, putting the observation into a comparative and realistic context. For example:

> ... With the help of physiotherapy she has mastered a lot of movement skills and is exploring as far as I think like most kids of her age.
>
> (Parental profile of girl, aged 3½ years, delayed development, 1992.)

and again:

> We think that she is a lot slower than other children in our circle of the same age ... she has the potential to get much further than her present promise suggests.
>
> (Parental profile of girl, aged 8 years, delayed development, seen as "slow learner", 1993.)

The author's *Guidelines for Writing a Parental Profile* have been endorsed, adopted and reproduced in the Department for Education's Code of Practice which forms the cornerstone of the 1993 Education Act, Part 3 on Special Educational Needs.

COMMENTARY ON THE PRACTICE AND POTENTIAL OF INVOLVING PARENTS IN ASSESSMENT

RELEVANCE AND APPLICABILITY TO SCHOOLS

A growing number of schools, primary, secondary and special, are demonstrating the effectiveness of the assessment dialogue, via use of, for example, Records of Achievement, the format of which encompasses opportunity for parents to record views and concerns.

Likewise the medium of Baseline Assessment (on-entry to school), using locally developed or published schemes such as *ALL ABOUT ME*, confers the opportunity for parents to contribute to beginning-school assessment and recording of progress.

Whatever the precise form of the instrument, and at whatever stage, it enables parents to consider the nature of the information they wish to convey to teachers and ask themselves the following questions:

- What would you like professionals (teachers, psychologists and others) to learn about your child at home?
- What information can you give professionals that they do not already have?
- How best can you describe the positive and good features of your child at home?
- How can you most accurately describe features of behaviour and development of your child at home that concern you?
- What is the most useful way (that is, useful to you and professionals) of summarising your feelings, your concerns and your views on the situation – and what you feel would be best for your child?
- Can you convey in your child's profile what his/her views are on their situation?

Reciprocally, what information can parents provide about their child which could help teachers? Responses from a workshop led by this author with teachers included:

- medical information – schools should ask appropriate questions on admission;
- likes and dislikes – things that upset the child;
- words and signs used at home to express needs (for example, going to the toilet);
- any change of circumstances (for example, moving house, break-up of relationship, new baby).

It is evident that legal requirements are galvanising reporting practice in many schools – and these schools are, at the same time, having to think prospectively about what parental involvement performance indicators will be looked for by the inspection teams in the Office for Standards in Education (OFSTED) schools inspection system required under the 1992 Education (Schools) Act. Inspectors will not only be interviewing a sample of parents, but eliciting their views by questionnaire. One of the questions will be: "Are you well enough informed about the work your child is doing?"

Schools' mandatory duties to report to parents on their child's progress have great potential to be a reciprocal rather than one-sided process. Hughes and colleagues looked in depth into parents' knowledge and understanding of Standard Assessment Tasks [SATs – mandatory assessments of maths and literacy administered in England and Wales at ages 7, 11, 13 and 16 years] and the information contained in teachers' reports, and their findings contain pointers to future reporting practice.

HOME-SCHOOL PARTNERSHIP IN ASSESSMENT OF SPECIAL EDUCATIONAL NEEDS

Notwithstanding the rights and opportunities conferred upon parents in the Special Educational Needs sphere (and see above for description of Parent Profiling), these have not been consistently applied within and across LEAs.

Personnel in different LEAs interpret the legal parental right to be involved in special educational needs processes differently. Survey evidence over the past six years confirms that indifferent LEA practice constitutes merely pointing out to parents what their rights are, but offering no encouragement or support, whereas "good" practice consists of the provision of guidelines to parents to support them in writing their views and to encourage active participation in decision- making. Of course, enabling parents to participate fully in making decisions as to placement and provision presupposes that LEAs must also let it be known what options are available.

Ultimately, assessment of any kind is a means to an end. If parents are not involved in the assessment process, they are denied a fundamental right. Again, survey evidence confirms that parents have been excluded from vital meetings, kept at the margins of decision-making, forced to appeal or to turn to second opinion. The onus has been on them to take the initiative, especially as LEAs have been constrained by diminishing resources. Parental involvement in formal assessment has therefore not been based on equality principles nationwide.

The 1993 Education Act, Part 3, is intended to address this and other related issues of assessment and provision and parental rights. Collectively these changes reflect an acknowledgment of parents' rights with regard to expressing a preference of mainstream or special school at the time of formal assessment, reducing the time taken to assess and produce a statement of special educational needs, thus commensurately reducing the stress upon parents, a phenomenon noted in all recent surveys. The local appeals system has given way to a tribunals system, directly funded by the Government. A prime purpose of these changes is to increase accountability to parents and their children.

As referred to above, the accompanying Code of Practice spells out parent-partnership principles and schools are expected to be able to demonstrate how these will be realised in practice. Reminders as to ways in which schools can and should involve parents in all Stages of Identification and Assessment permeate the Code of Practice and, as if to demonstrate the reciprocal nature of partnership, the Department for Education has issued a companion booklet for parents.

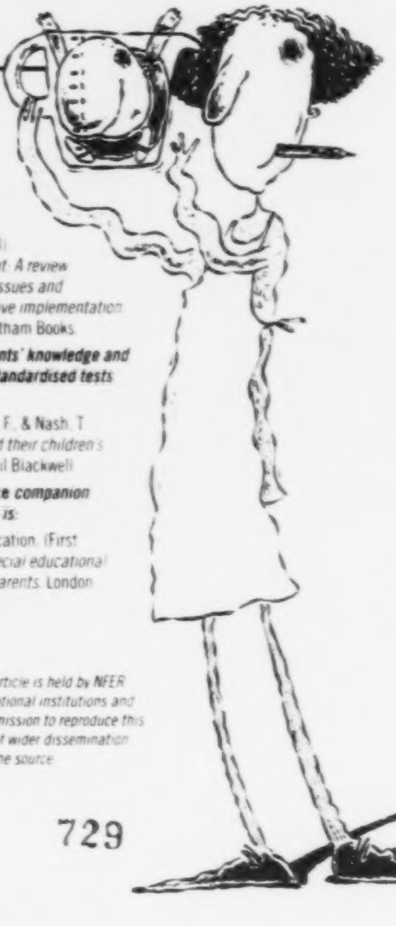
Whatever differential school practice has been, henceforth it will be incumbent upon them, and also the parents, to exercise old and newly conferred rights and responsibilities carefully and sensitively on behalf of the special needs children they have in common.

RIGHTS AND RESPONSIBILITIES IN THE ASSESSMENT PARTNERSHIP

Fundamental to the Reciprocal Model is the mutual expression of and respect for the rights of the different parties. In a context where a national testing system needs careful explaining to parents, and where results need accurate and sensitive interpretation, teachers must be guaranteed adequate opportunities to do this; and parents must likewise be guaranteed protected time to have that dialogue with teachers and to ask questions and express their view.

Perhaps an "Assessment Charter" is needed to spell out these rights: the benefits of children; redress procedures for invasion of privacy, misrepresentation of facts, passing on assessment data without parental knowledge or consent, lack of due consultation, lack of translation facilities and use of inappropriate assessment measures; and lack of action consequent upon assessment.

If such a Charter were agreed to be feasible and operable, its very existence should reduce the likelihood of these potentially adversarial issues leading to conflict or litigation. A shared and open agenda represents the most positive starting-point for teachers and parents to engage in assessment – and this must be an alliance for children.



NOTES

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9

MAKING THE TRANSITION FROM YEAR 12

The relationship between *decision-making style* and information gathering

STEPHEN B. JOHNSON

The decisions an adolescent makes about his or her entry into the workforce, while unlikely to be permanent, are critical in setting the tone for early adult life. Vocational decisions influence self-concept, lifestyle, choice of friends, access to material resources, and avocational pursuits. To make such an important decision requires information.

This paper reports a study which investigated the relationship between one model of decision-making style (Janis & Mann, 1977) and Year 12 students' self-reported use of sources to obtain information about themselves and the world of work.

WHY EXAMINE DECISION MAKING?

The educational and labour market environments have altered dramatically over the past two decades. Governments have responded by developing plans to "improve" and "develop" the post-compulsory education and training system to meet the perceived demands of a diverse student body and a post-industrial workplace. A recommendation found within many such reports is the emphasis on the development of decision-making skills. Such skills are viewed as necessary in order for the future workforce to be able to cope with change; and to provide students with independence, the ability to make effective decisions about their present lives and future life-span potential, and preparation for involvement in participatory decision making.

Counselling practitioners may acknowledge that assisting clients with decision making is their primary role, but advances in decision-making theory have rarely made an impact. While there are similarities in the decision-making skills of adolescent and adults, how those under 18 years of age make decisions is poorly understood.

DECISION-MAKING STYLE

Janis and Mann (1977) indicated that a decision-maker chooses from a range of decision-making strategies depending on such factors as time and the complexity and importance of the task. They proposed that decision makers use vigilant (reasoned, using information resources), complacent, panicky, or copout (depend on someone else) approaches to making a decision. Their reasoned decision-making model describes steps that include: the analysis of what options are available, the consequences of a decision, and ongoing information search and appraisal.

INFORMATION

The concept of information is central to theories of decision making. Vocational decision making has been described as a process by which the individual, when confronted with an educational-vocational problem, collects information designed either to lead to a plan to deal with the problem or to identify more information required to solve the problem. Reasoned decision-making models reinforce the central concept of the gathering and processing of information about options and consequences.

Often these models assume that the more information about the self and occupations an individual has the more likely individuals are to make "effective" decisions in terms of personal benefit. As a consequence, information about vocations and the self is stressed during the transition from school to the world beyond. Over the last decade the amount of vocational information available in Australian schools has exploded. Formal resources provided by government agencies, businesses, and universities have substantially increased in scope, medium of presentation, and complexity. Informal resources such as friends, family, the electronic media, and part-time work experience also offer Year 12 students a plethora of information about themselves and the world of work. More, however, is not necessarily better.

Researchers and counsellors have continually noted that some individuals engage in information gathering more than others. Many structural and individual factors are suggested to account for this difference. Anxiety, rewards, motivation, work role salience, coherent ego identity, decision-making style and the characteristics of information (for example, accessibility, accuracy) have all been shown to influence the information-gathering behaviour of individuals.

There has been little exploration of the way in which information is actually obtained and processed by students. It is assumed that what occurs in the laboratory, analysis of past decisions, or behaviours of older individuals, will be mirrored within the transitional phase of school to work. Counsellors in the field, however, are bedevilled by students who fail to utilise the formal information services provided. Research and practice has consistently noted that many individuals do not take advantage of the formal systems designed to help in decision making, or even of their own cognitive capabilities.

The decision-making style of the individual is crucial in establishing the conditions of information gathering and appraisal. Information about how decision-making strategies influence the use and integration of information offer the vocational counsellor wide scope to explore, not only the information needs of the individual, but how the individual will react to information.

My research looked at whether or not decision-making styles influence individual information gathering. If so, programs to teach decision making would have positive effects on student decisions, enabling students to build on their decision skills to make a smoother transition from high school and face the other major transitions in their life with confidence.

METHOD

Year 12 students in four Western Australian government senior high schools were asked to complete a survey on their decision-making skills and the information sources they were using to explore possible post-secondary options. The students answered the same questionnaire 12 weeks apart at the beginning and middle of the school year in order to compare changes in their sources of information.

Students were asked to complete the Adolescent Decision-making Questionnaire (ADMQ) and two separate scales on information-gathering behaviour. The ADMQ assesses the four decision-making styles of vigilance, panic, copout, and complacency. Students were also asked to rate on a scale of 1 (None) to 4 (A great deal) how much information they had received from a number of sources about their *abilities, interests and values*, and *the world outside of school*. The sources of information used (for example, mother, same age peer, Youth Education Officer, career handbooks) were obtained from interviews with Year 12 students from the same schools in the previous year and career education literature. These two areas of information (*abilities* and *world outside*) represent an emphasis in counselling and vocational curricula.

FINDINGS AND DISCUSSION

Statistical analysis of the students' responses to the different sources of information indicated that students obtained information from three broad groups: *personal experiences* (for example, school or work); *family and same age peers*; and, *other adults* (for example, older peers group members, Youth Education Officers). These three broad groups were used to explore differences in the information gathered about *abilities* and *the world outside* for students with different decision-making styles and for males and females.

INFORMATION GATHERING

One hundred and thirty-one students completed the questionnaire on both the first and second occasions. Analysis of the responses about information gathering indicated that in all cases students reported a significant increase in their collection of information from the three different sources of information. There was a very large increase in the amount of information gathering about the self (*abilities, interests, values*) from all three sources over the 12-week-period. The largest increase in information gathering about the world outside of school was information obtained from *other adults*. The results suggest that many students are only beginning their information gathering about post-school options.

Year 12 may be too late to be providing information for decisions, or even decision-making.

There were also significant differences between males and females in the amount of information gathered from *personal experience* and *other adults*. For both of these sources female students reported greater use to obtain information about themselves and the world outside of school than their male counterparts. There was no gender difference in the use of *family and peer* sources of information. The results suggest that female students are more aware of the need for information about their post-school options and were using more "expert" sources of information.

An examination of the differences between the use of the three sources of information to collect information about *abilities, interests and values*, and *the world* was also undertaken. At the first survey students used all three groups of information (*personal experiences, family*, and *other adults*) to collect more information about *the world* than they did about themselves. By the second survey students used *family* and *other adults* to collect information in equal measure about *the world* and themselves. The students used *personal experiences* to collect more information about their own *abilities* than about *the world*. That is, students relied more on sources of information to inform them about the world beyond school early on in the year. Later in the year they used *personal experiences* to help gather information about themselves rather than the world beyond school.

The substantial increase in the use of information sources between the two surveys suggests that many individuals were just beginning to engage in conscious career exploration. Students are also relying on "expert" sources of information to establish a picture of the world beyond the confines of their school environment. Female students are apparently more willing to turn to expert sources for information. The results highlight the use of different sources of information at different stages of decision making, and for different purposes.

DECISION-MAKING STYLES

Over the two surveys students reported an increase in their *complacent* and *copout* decision-making behaviour but were consistent over time in their *vigilant* and *panic* decision-making behaviour. That is, students reported increases in behaviour such as going along with what other people suggested, avoiding decisions, or drifting into a decision. Students did not change their ratings about behaviour such as feeling panicked, taking care with their decision making, or taking time. There was no significant difference between males and females in their reporting of their decision-making styles.

The increase in *complacency* and *copout* suggest that few students are actively engaged in decision making and may feel powerless or dependent on others for their decisions by Year 12.

THE RELATIONSHIPS BETWEEN THE MEASURES

The study also looked at whether the way an individual made a decision (that is, *complacent, copout, panic* or *vigilance*) influenced the amount of information they gathered about themselves and the world outside of school from the three information sources. Table 1 displays the results of Multiple Regression analysis that examined this relationship.

At the beginning of the year the student's decision-making styles significantly predicted the use of *personal experience* and *other adult* sources to gather information about the *world of work*. Those with a more reasoned approach to decision making (that is, more vigilant) were more likely to use *personal experience* and *other adults* to collect information about the world beyond the school environment. There was also an indication that those who rated themselves as more panicky decision makers were also relying on *personal experience* to inform them about the *world of work*.

Twelve weeks later the decision-making style of the individual significantly predicted the use of *personal experiences* and *family and peers* to gather information about *abilities*. Students who reported more *copout* decision-making behaviour were less likely to rely on *personal experience* for information about their abilities. Those who rated themselves as more *complacent* deciders were more likely to rely on *family* for information about their abilities.

Similar to findings of other researchers (for example, Blustein & Phillips, 1988), those more vigilant in their decision making, that is more reasoned decision makers, appeared to be obtaining information from informed sources (for example, older peer group members or counsellors) about the world of work. Though this was not consistent over the two surveys, the findings suggest that reasoned decision makers were more focused in the sources of information they used.

In comparison to reasoned deciders, less reasoned individuals, particularly those who reported high levels of *complacent* and *copout* decision-making behaviour, were more likely to use family and personal experiences to gather information about their abilities and interests. This suggests a form of pragmatic information gathering in using readily accessible sources who would not provide information that conflicted with established goals. It is proposed that such conflict would necessitate the individual's deeper consideration of their post-secondary goals, something that many students may not be prepared to contemplate.

GENDER AND DECISION-MAKING STYLE

While there were no differences in male and female answers to questions about their decision-making styles there were significant differences between the sexes in their information source use. As a consequence, statistical analysis was used to determine if the decision-making style of males and females was differently related to their information-gathering behaviour. The ADMQ did not significantly predict the gathering of any information by males. That is, no matter how the male students described themselves as a decider, complacent, panicky or vigilant, they did not show any differences in the use of the three information sources to gather information about themselves or the world.

For females the way they approached decision making significantly predicted the use of different sources throughout the year (see Table 2). At the beginning of the year, female students' decision-making styles were indicative of the use of all three groups of sources to gather information about themselves and the world beyond school.

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Twelve weeks later the students' reported decision-making style was only indicative of their collection of information about themselves.

The survey at the beginning of the year indicated that female students who reported higher levels of vigilant decision-making behaviour were more likely to be using the three sources information to collect details about themselves and the world beyond school. For the second survey 12 weeks later, higher levels of vigilant decision-making behaviour were associated with increased use of *personal experiences* and *other adults* sources of information to collect information about themselves.

For the first and second survey, female students who reported more *complacent* decision-making behaviour also reported less use of *personal experiences* and *family and peers* to collect information about their abilities, interests and values. For the first survey, higher levels of *copout* behaviour were associated with less use of *personal experiences* to collect information about abilities and less use of *family and peers* to gather information about work. For the second survey, female students who reported higher levels of *copout* decision-making behaviour also reported less use of *personal experiences* to gather information about their *abilities, interests* and *values.*

The lack of a relationship for male respondents between their decision-making skills and information gathering suggests they have ceased engaging in any form of thought about their post-secondary options. This could be attributable to an already established idea of their post-secondary path or inaccurate reporting of their decision-making skills and/or information gathering. Female behaviour is more consistent with theory and suggests that they are still actively engaged in the decision-making process. It is possible that female students are more mature in their self-appraisal and in their approaches to decision making.

CONCLUSION

The relationship between adolescent decision-making style and information gathering is not as strong as theory would suggest. The results indicated that only seven to ten percent of the information-gathering behaviour of the students surveyed could be ascribed to their decision-making style. This is broadly consistent with other researchers and theorists who suggest a multiplicity of personal and environmental factors influencing behaviour. That such individualistic cognitive processes have little apparent influence on the way students are making their decisions is cause for concern. It indicates that while students may have the skills to make reasoned decisions they do not necessarily have the opportunity. It is suggested that students feel isolated from the decision-making process about their future, relying on friends, family and demands of their final year to make "their" decision for them.

The educaton and counselling system could destress the final year.

This has a number of implications. It suggests that constraints within the occupational and social world of the adolescent may limit their use of appropriate decision-making strategies. As such there is a need to establish decision-making programs within the education system. It is not enough to provide information. Year 12 may be too late to be providing information for decisions, or even decision-making skills. Government statements about the necessity for students to leave school with the capacity to make decisions requires a realisation that students do have such capacity but that the system constrains them.

The study indicates a heavy reliance on dependent decision-making styles by many students. The results suggest that while students were collecting more information over the 12 weeks they also felt that they were increasingly allowing others to make a decision for them. Students did not apparently feel that they were making a panicky decision but neither did they feel that they were using a more reasoned approach, that is taking time and care with their decision.

The lack of a clear link between decision-making style and information gathering may be the result of students ceasing to engage in appropriate information-gathering in order to avoid any non-supportive information, or because the demands over the last year of high school make a concentration on post-secondary options difficult. That more vigilant females did not entirely match this picture suggests that they behave closer to the theoretical model of a reasoned-decider, someone who continually monitors their options and is not afraid of conflicting information. It is also possible that students feel a lack of control about their post-secondary

TABLE 1: Regression data for six dependent variables with styles of decision-making as the independent variables for the first and second survey

Dependent Variable	R^2	*Adj* R^2	F	p	*IV*
(FIRST SURVEY)					
Abilities					
Personal experience	.03	.01	1.71	.15	
Family and peers	.02	.01	1.65	.16	
Other adult	.04	.02	2.22	.07	
World of work					
Personal experience	.06	.04	3.52	.01	vig, panic
Family and peers	.02	.01	1.42	.23	
Other adult	.05	.03	2.88	.02	vig
(SECOND SURVEY)					
Abilities					
Personal experience	.07	.04	2.60	.03	comp, cop
Family and peers	.07	.04	2.77	.03	comp
Other adult	.06	.03	2.18	.07	
World of work					
Personal experience	.05	.02	1.92	.11	
Family and peers	.03	.01	1.25	.29	
Other adult	.06	.03	2.31	.06	

(IV = independent variable; vig = vigilance; com = complacency; cop = copout)

TABLE 2: Results of significant multiple regression analyses for females on the predictive nature of the ADMQ on information-gathering behaviour, with significant IVs listed

Dependent Variable	R^2	*Adj* R^2	F	p	*significant IV*
(FIRST SURVEY)					
Abilities					
Personal experience	.11	.07	3.45	.01	vig, com, cop
Family and peers	.10	.07	3.31	.01	vig, com
Other adult	.10	.07	3.27	.01	vig
World of work					
Personal experience	.12	.09	4.07	.01	vig
Family and peers	.10	.07	3.13	.02	vig, cop
Other adult	.11	.08	3.51	.01	vig
(SECOND SURVEY)					
Abilities					
Personal experience	.12	.07	2.64	.04	vig, com, cop
Family and peers	.13	.08	2.78	.03	com
Other adult	.12	.08	2.72	.04	vig, com

(IV = independent variable; vig = vigilance; com = complacency; cop = copout)

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path as it relies so heavily on their final examination grades.

Information gathering is idiosyncratic by nature. Educational and counselling systems must move away from the idea that all they need do is supply information. The information should meet the specific needs of students and be presented in a format that is easily used. This does not necessarily mean more printed materials or computer programs. Students are faced with many conflicting and varied sources of information and many rely on accessible sources. Students require wider access to information sources such as recent graduates and knowledgable parents and siblings who have entered the many post-secondary paths that face modern adolescents, for example, part-time work, travel or unemployment. Schools should be encouraged to provide timely visits to school and work sites, visits from members of the community and discussions with peers and role models. Education systems must also do more to acknowledge the validity of personal experiences, such as out-of-school work, as sources of information about post-secondary options.

Students require help in defining their choices, not through more untargeted information but through active decision making. This involves not only a development of an understanding of the self but also of the realities of post-secondary life. Educators and counsellors must begin to explore non-traditional options and be willing to support students who choose different paths. The decision-making process itself is much more relevant to students, counsellors and researchers than the option the individual has chosen. Many students are deciding by not deciding, afraid to take risks. Counsellors and educators should encourage such risks. Students will undergo many changes in their future working lives that will be the result of their own behaviours and the environment. Counselling systems must acknowledge that decisions are sometimes out of an individual's control, but that individuals do have some impact on the environment and can change things.

If students are to engage reasoned decision making they require an understanding of the importance of their decision and a feeling that they have adequate time to find an appropriate solution. The question to be asked is whether students, in a supportive environment with plenty of resources (that is, access to recent graduates, non-judgmental counselling), should be "stressed"? Is this an appropriate way for the system to help students make decisions? The vocational education system appears to be moving down this path with its increasing emphasis on appropriate transitions, especially to work and further education. Conversely, the education and counselling system could de-stress the final year as a major period of transition. Year 12 is a stressful decision point for historical and social reasons, yet the reality of multiple pathways and rapid changes in vocational goals suggests that it is possible to de-stress Year 12. The increasing movement of students into higher education and apparent moratorium in decision making this may reflect, suggest to this author that students be provided with a view of the world that de-emphasises the school to work transition. Students could be provided with time enough to mature as decision makers rather than push them into a stress-filled decision that to many appear to be an "all or nothing" transition point. Failing this, it is up to the counsellor and educator to reinforce the notion of individual psychological differences in vocational decision making. Differences in the self may be overwhelmed by social and occupational influences on decision making (for example, parental support) but is, nonetheless, an important consideration for the individual.

NOTES

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HOW YOUNG PEOPLE MAKE *Career decisions*

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Although career decision making by young people is of central importance in current training policy in Britain, there has been little recent research into how career decisions are made.

INVISIBILITY OF CAREER DECISION MAKING

The ways in which young people make career decisions has become much more central to vocational education and training policy in Britain in recent years, yet the process itself is often unaddressed. For the Confederation of British Industry (CBI), giving the young person more control over his/her own future is seen as a central plank in providing high quality education and training. For this reason, they advocate the use of vouchers to give the young person "purchasing power" for all post-16 [post compulsory] provision. They emphasise the need for enhanced, neutral careers guidance, but never address explicitly the ways in which career decisions are made. Such thinking has been a major influence on the development of current government policy.

Training credits are a key part of this new policy. They were piloted in 11 areas in England and Scotland from 1991 and in a further nine areas in a second pilot phase from 1993. From the summer of 1995, they became national in scope. The training credits scheme is based on the principle of issuing each school leaver with a voucher, or credit. In theory, the young person with the credit is seen as a customer, using the voucher to purchase training. Training organisations and employers would have to improve the quality of their training or they will not attract enough customers. "Neutral" careers guidance was seen as essential to help young people make good career decisions.

On the other hand, several major research studies of the transition from school to work have emphasised the persistence of long-standing inequalities between the career trajectories followed by different groups of young people. Examples include the *Economic and Social Research Council 16-19 Initiative*, the Employment Department Youth Cohort Study and its Scottish equivalent, the *Scottish Young People's Surveys*. All these studies confirm deep seated inequalities in the British labour market. Such patterns of the results of occupational choice present the opposite picture to that of individual empowerment in decision making found in CBI and government policy statements. Yet these studies also tell us little about how the career decisions which result in these patterns are actually made.

Two recent research studies on career decision making focus on factors such as sources of advice and information, different types of guidance provision, and the perceptions of young people of different pathways. The decision making itself is not addressed directly in either of them.

Within government policy and much related thinking, a technically rational view of career decision making is assumed. An extreme version is encapsulated in the following:

> We assume that, knowing their capacities and other personal characteristics, individuals form an estimate of expected earnings resulting from each education, training and labour market option, and, taking into account their taste for each, choose the stream which offers the greatest net utility.

Such a technically rational view of decision making sees it as a means to an end. From this perspective, good decision making takes the young person through a series of logical stages. In the careers guidance action planning process used in one training credits pilot scheme, this moved from knowing about yourself through finding out about the labour market into selecting a precise career and identifying the specific training needs. The assumption is that this technical process is largely separate from the context and culture of the individual making the decisions, although the decision will be influenced by such factors. The inevitable focus of decision making, when seen from this perspective, is the making of a "correct" career decision, as a preliminary to the next stage of education and/or training. From this point of view, careers education and guidance are essential to increase the chances of such a correct decision, mainly by providing better information and giving help in how to make a decision. The logic continues that, if more correct decisions are made, then there will be less "wastage" in post-16 education and training provision.

Together with Andrew Sparkes (of Exeter University) I recently completed an

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investigation into one of the original training credits pilot schemes. We focused on the second cohort of trainees, who left school in summer 1992. The project is informed by the basic assumptions underpinning interpretive educational research, which seek to understand phenomena from the perspectives of those involved in the action. We first interviewed 115 pupils, in six schools, who were selected by their careers teachers as possibly using training credits. Of the 115, 91 were in Year 11 [new nomenclature for the last year of compulsory schooling] and 26 in the sixth form [traditional nomenclature], 59 boys and 56 girls. Out of this sample, we selected a small group of trainees and tracked them through 15 months of the training process. Each trainee was the centre of a stakeholder network and, at each stage in the research, we also interviewed other stakeholders with whom the trainees came into contract. The pattern of decision making we discovered was very different from the technically rational assumptions of much current policy.

YOUNG PEOPLE'S DESCRIPTIONS OF HOW THEY MADE CAREER DECISIONS

We asked all 115 pupils why and how they had decided on a particular course of action for the next year and beyond. From those who had made decisions, some clear patterns emerged.

Many said that they were influenced by close relatives or neighbours who worked in the same fields. However, this influence was more subtle than simply listening to advice. It was grounded in long-term experiences:

> [I want to be a] light vehicle mechanic... most of my family have done it already – my dad, my brother, my grandad and people like that. [For work experience] I went to [garage name]. I like it all, just like fixing things and taking it out on test drives. ... They [my parents] wish I'd go into secretarial work because they think it's not a girl's thing. ... But he [dad] says if it's what I want to do I should go for it (Year 11 girl).

> I did want to be a mechanic but I dont want to do that now. Well, no one employs girls really. They all want men. Well, I asked a few garages and they said they wouldn't take you 'cos it was a girl. I prefer hairdressing. It's warmer. ... Dad laughed, he thought I'd do something like that. I'm always doing stuff with my hair (Year 11 girl).

Work experience strongly influenced many pupils, some positively and some negatively. In some cases it helped them in getting a job:

> I want to do hairdressing YT [Youth Training, the scheme which operated prior to the use of Credits in the pilot area]. I was looking for a Saturday job and my mate had had... two offers so I thought I'd go for it, hairdressing, and I ended up really liking doing it. ... Before I wanted to go into hotel work but I did my work but I did my work experience and hated it. Fussy, it was too fussy, especially doing it at [named hotel] (Year 11 girl).

> ...It was my second choice, after computer programming. I'm getting a night school course to learn all that stuff. ...

> ...My stepdad works for [named firm]... and I started working there. Then when we joined the 6th form we had to do one day a week work experience, so I decided to do it there. And they chose me out of four other people (Year 12 boy).

Some of the pupils have particular interests which they would like to incorporate into careers, and childhood ambitions sometimes survive in some form. Enjoyment of a job is often felt to be an important consideration:

> Well I've wanted to do that [caring] since I was seven. I wanted to be at work. First I wanted to be a nurse, then my mum was in hospital two or three weeks ago and I decided I didn't want to be a nurse just in case my family was in there. So I decided to carry on with the disabled ... in a school. ... I've got a disabled family, disabled cousins and friends (Year 11 girl).

> [I would like a job] in sports leisure. I just like sport and that really. Just working with people... I just went into sport because I used to help coach this football team. ... I just decided to help people and that in sport (Year 11 boy).

Many wanted training with their chosen job, and some mentioned specifically the desire for enough education or training to get eventual promotion or a career:

> Mum's been a waitress for eight years. She said to me one day "We're really busy at work, do you want to come and wash pots?" That was about two years ago. I started washing pots as a Saturday job, and then I started like making the ploughmans in the summer, and did my work experience at a pub ... like doing kitchen staff and then as a chambermaid. And now I'm an actual waitress on Saturdays and Friday nights sometimes... He [my boss] said he'd be happy ... when I leave school to employ me for more days a week. I said I didn't want that. I wanted to go to college to take a two year course then work my way up the ladder (Year 11 girl).

Some changed their minds, while others were still unclear and undecided:

> I'm working with my dad painting and decorating ... because I enjoy doing it. I work like after school and at the weekend, at the moment anyway, and I enjoy doing it. I changed my mind because I was working with my mum ... shopwork. But I changed my mind about doing that one because I thought it might not suit me. So I'm doing this one [painting] now (Year 11 boy).

> I want to do office work like Claire [another young woman in the same group interview]. ... I just enjoy it. ... I only just decided because back along I wanted to do retail work but I got a Saturday job and it gets boring after a while, working in shops (Year 11 girl).

Some pupils described careful, considered decision making leading up to the choice of a job:

> I started off doing geography and maths [A levels]. Geography didn't work out for me, and then, the maths course, they had a half way exam and unfortunately I didn't achieve the right result to carry on the Upper Sixth. So I carried on with economics, and took up doing accountancy in my own time. I originally planned to go to university, but once I decided I wanted to be an accountant and with the geography and maths, I realised I wouldn't get in.

> ...The main aspect was a friend of mine who works. He's actually doing his accountancy technician training with a firm in [named town]. We were talking through, I like working with figures. I like to think I'm good at maths, so I thought that would be a nice job for me to do. It appeals to me after starting the accountancy course. It's sort of become more attractive and keeping it all laid out. ...

These quotations demonstrate three key qualities. First, the pupils are describing making decisions. In all cases, they have been instrumental, to a greater or lesser extent, in determining what career they will eventually follow. Second, they had largely *rational* reasons for making their choices and for changing their minds. That is, they are often choosing jobs they know a lot about and the source of information is often an insider who has no vested interest in "selling" a vacancy and whose judgment they can trust because they know them personally. Alternatively, the information comes from actually doing some aspect of the job themselves.

Finally, these rational decisions were pragmatic, although sometimes in a restricted and partly inadequate way. There are several dimensions to this pragmatism. The decisions were based on partial information which was localised, being based on the familiar and the known. The decision making was context-related, and cannot be separated from the family background, culture and life histories

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of the pupils. The decisions were opportunistic, being based on fortuitous contacts and experiences. The timing of the decisions was sporadic, in that decisions were made when the pupil felt able to do so and were reactions to opportunities as they were encountered. Decisions were often only partially rational, being also influenced by feelings and emotions. They were often partly intuitive.

PRAGMATICALLY RATIONAL DECISION MAKING

The career decisions of these young people can only be understood in terms of their own life histories, wherein identity had developed and evolved through interaction with significant others, and with the culture in which the subject has lived and is living. I am using "culture" to describe the socially constructed and historically derived common base of knowledge, values and norms for action that people grow into and come to take as a natural way of life. As young people grow up, they absorb and reinterpret meanings drawn from the culture which they inhabit.

For the French sociologist Pierre Bourdieu, a key concept is *habitus*. This encapsulates the ways in which a person's beliefs, ideas and preferences are individually subjective but also influenced by the objective social networks and cultural traditions in which that person lives. Habitus involves more than perceptions, for Bourdieu sees it as deriving from, and being part of, the whole person or body. This concept is useful particularly, because it can incorporate multiple and overlapping identities, for example as tennis player, sister, mother and shop assistant.

The ways in which habitus develops are complex. For example, it has been suggested that we know through "practical consciousness" (tacit knowledge) and "discursive consciousness" (what we can articulate). The latter is grounded in the former. Both contribute to habitus. Both types of consciousness can be seen as developing through schemata. From childhood, young people amass conceptual structures (schemata) which serve as tools for understanding aspects of their experiences. A schema structures what a person knows of the world, by filtering out "irrelevances" and allowing sense to be made of partial information. In this way, two lights seen from a car in the dark can be turned into a cat or an approaching vehicle. A repertoire of schemata contributes to the dispositions that make up habitus. As new experiences are gained, schemata are modified and developed and as they change so does what is recognised in the surrounding world. In this interactive way, the life history of the individual shapes and is shaped by his/her common sense experience. In choosing any action an individual uses his/her own schematic repertoire. No one can step outside such personal development and therefore decision making can never be context-free.

Young people make career decisions within horizons for action. By "horizon for action", I mean the area within which actions can be taken and decisions made. Habitus and the opportunity structures of labour market both influence horizons for action and are interrelated, for perceptions of what might be available and what might be appropriate affect decisions, and job or training opportunities are simultaneously subjective and objective.

Because schemas filter information, horizons for action both limit and enable our view of the world and the choices we can make within it. Thus, the fact that there are jobs for girls in engineering is irrelevant if a young woman does not perceive engineering as an appropriate career. On the other hand, we have already seen an example of a young woman who considered working in a garage, because her life history was such that this particular, stereotypically male, occupation was seen as both possible and plausible.

New information is absorbed constantly within an existing schematic framework, causing refinement and modification to the habitus. The reason why some young people vehemently reject careers advice is that what is being said to them does not fit with their existing schematic view of themselves or their perceptions of appropriate careers opportunities. Furthermore, such opportunities are not just "out there", as is implied in a technical view of decision making. They can be created, for example as young people or their parents use local contacts to find a training placement. For several of the young people we studied, employers created training places because they knew the young person and/or their families.

Within their horizons for action, many young people in our study made rational decisions. For example, many entered or rejected an occupation based on personal experience (work experience or part-time employment), or on advice from a friend, relative or neighbour who knew the occupation and/or firm well.

Within horizons for action, which can be broad or narrow, fairly fixed or fairly fluid, young people are often opportunistic. That is, they focus attention on existing or potential opportunities in the labour market. In describing this, the English language forces me towards a dualism that is both artificial and unhelpful. On the one hand, young people can be described as reacting to opportunities, as when, for example, someone decides to take up a placement found by a friend or offered by a work experience employer. However, this implies a passivity that is grossly oversimplified. The alternative is to describe them as creating opportunities, for example by approaching an employer, or using local networks to do it for them. In reality it was often both these things, simultaneously.

The generalisability of this model of decision making depends on the quality of the theory developed, not on whether the small sample of young people from which it is derived is somehow "representative". It is not. Nevertheless, some have said that only relatively less able and immature young people, lacking in confidence and maturity, make pragmatic decisions of the type described. While I have no empirical evidence to challenge such an assumption directly, it does not ring true. For example, Baumgardner identified "happenstance" and the absence of planned decision making primarily while working with undergraduates in the United States making decisions about careers and post-higher education. In a recent article, Brown, 1994-5 President of the American Educational Research Association, described how she came to study psychology at university. I would argue that her account is effectively explained by our model of pragmatic decision making, as are the sorts of statement made by the young people we interviewed:

> In high school, I specialised in 18th century literature and 19th century history, and was on my way to study history in college. Why switch? I saw a television programme on animal learning, on how animals learn naturally in their environments, an introduction to ethology .... I looked up animal learning in my handy guide to universities and found that to study learning, you needed a degree in psychology. Thus prepared, I set out for an interview, having seen one television programme and read Freud's *Psychology of Everyday Life* on the train getting there. By chance the head of department was an expert in 18th century literature. We discussed poetry for two hours. I got a scholarship to study psychology!

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PROGRESS AFTER MAKING A DECISION

As part of the study, we followed ten of these young people through the first 15 months of their training after leaving school. Some met with largely untroubled progress. However, although others seemed determined on one pathway while talking to a careers officer, within weeks or months they could have changed their minds. Such changes of mind alter the horizons for action and the identity of the person involved. Becky, for example, originally wanted to be a nursery nurse and was being guided appropriately towards a full-time college course. However, she later decided she did not want to stay in full-time education and went to see a local training provider, under the training credits scheme. He told her he could organise a placement in a dental surgery, which appealed. Becky enjoyed the work, despite not having compared it technically with other jobs or with her own talents and interests. Helen was forced to changed when she was made redundant from her car-spraying placement. She tried to find another place to do the same thing, but was afraid that if she waited too long she would end up with nothing. She then considered a much wider range of possible jobs and took the first place that was offered, in a record shop.

Laura went through a series of changes. When she first left school, she had a training place in a shop, where she was, probably unrealistically, hoping to combine shop work with beautician training. She abandoned that, and supported by a training provider, took a training place in a nursery school. Neither Laura, her parents or her careers officer could remember her ever expressing interest in this sort of work before. Nevertheless, her placement started well, and the employer was so pleased she offered Laura a job. However, soon after that things went wrong, and Laura eventually left. As our fieldwork finished, she had dropped out of the training credits scheme altogether. Despite considerable financial hardship, her mother was paying for her to have private tuition in shorthand, typing, and office practice, in the hope that she would become a secretary.

IMPLICATIONS FOR CAREERS EDUCATION AND GUIDANCE

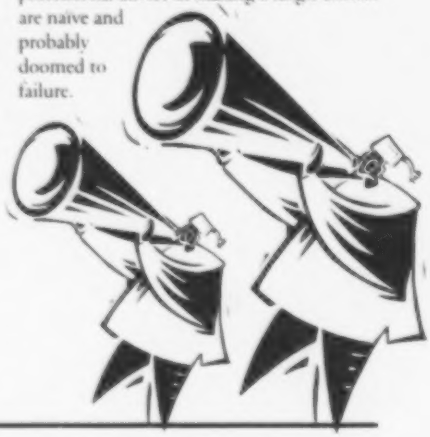
This fuller understanding of the ways in which career decisions are actually made suggests some caution about current policies for careers education and guidance. It is for others, with more expertise in guidance than I have, to work the implications out in detail. What follows are a few pointers to begin a discussion.

Many of our interviewees valued their careers guidance. High quality careers education and guidance provide an invaluable service to young people, but they cannot ensure that "correct" choices are made. Indeed, there are fundamental dangers in current arrangements, where by education and training providers are penalised if young people do not stay on the course. Our evidence suggests that, with the best guidance in the world, many will change their minds and decisions that seemed to make sense in September may seem irrelevant in January. One of the strongest features of the training credits scheme we investigated was that when a young person changed his or her occupational area, a new credit was issued without penalty. Laura, for example, took advantage of this when she began in the nursery school.

It follows that the value of professional guidance lies in the quality of counselling given, rather than the outcomes, or even the completion of action plans. High quality advice cannot be measured by whether or not a plan exists; the quality of the plan cannot be judged by whether or not it is eventually followed; some young people will need far more time than others to prepare a plan and some will need several plans.

While action planning, as part of a guidance system, may be useful in helping a young person to identify the next steps to be taken, such plans should look forward from the present, rather than build towards a future which might change. Any careers guidance system should be flexible enough to accommodate changes of mind.

Perhaps above all, policy makers and practitioners must recognise the complexity of the career decision-making process. Approaches which see guidance simply as providing more and better information plus professional advice in making a single choice, are naive and probably doomed to failure.



NOTES

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Hodkinson, P (1995). How young people make career decisions. *Education and Training*, *37* (8), 3-8.

For more detail about the research, see:

Hodkinson, P, Sparkes, A. C. & Hodkinson, H. (In press). *Triumphs and tears: Young people, markets and the transition from school to work*. London: David Fulton.

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The importance of giving young people more control over their future is advocated by:

Confederation of British Industry (1993). *Routes for success – careership: A strategy for all 16-19-year-old learning*. London: CBI.

British Governmental policy on careers guidance can be found in:

Employment Department/Department of Education and Science. (1991). *Education and Training for the 21st century*. London: HMSO.

British Government White Paper (1991). *Competitiveness: Helping business to win*. London: HMSO.

Details of the Scottish Young People's Survey can be found in:

Furlong, A. (1992). *Growing up in a classless society? School to work transitions*. Edinburgh: Edinburgh University Press.

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Boreham, N. C., & Arthur, T. A. A. (1993). *Information requirements in occupational decision making*. Research Series, No. 8. London: Employment Department.

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For an extreme version of a technically rational view of career decision making see page 13 of:

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The relationship between correct decisions and less wastage in post-16 education and training is argued in:

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The ideas of practical and discursive consciousness are from:

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11

WHAT DO CHILDREN THINK ABOUT FAMILIES?

FAMILY!
CHRISTINE TATE

Exploring children's perceptions of families as part of a classroom activity can be a valuable way of broadening and challenging their pictures of families.

Maureen Ryan
Victoria University of Technology

Writing in 1982 about the rights of children, Asche suggested a need existed for a broad course which would teach children not just sex education but family education and which would include discussion of social, economic and psychological aspects of family relationships. This view has been reiterated most recently by The National Council for the International Year of the Family which endorsed the importance of school-based human relationships education at every level of the school, and which

> ... does not accept a narrow definition of education designed to prepare children and young people for employment. Instead, education is seen as central to life preparation, to the well-being of individuals, relationships and family life.

"WHAT IS A FAMILY?"

Children can be very articulate when answering the question "What is a family?" as I discovered during my 1991 study of 1030 children aged between eight and 12 years. The children, drawn from Grades 3/4 and 5/6 in inner and outer western suburban Melbourne schools, wrote fluently and often with passion about families and about changes in families.

The comprehensive description below is an example of the way in which some children intertwined many different concepts.

> A family is a group of people in all sorts of numbers. You have a mum and a dad, brothers and sisters, cousins, aunties, uncles, grandpas and grandmas etc. who all relate to each other. You might have step-sisters and step-brothers but you are still a family all together. You can have animals in your family like a cat, dog, budgie, parrot. You share your feelings with your family but sometimes you might like to keep it to yourself. If you are sometimes nervous you might like to tell your mum and dad, maybe your cat or dog. Maybe if you

> come from a different country you have religions that you learn at home with your family. You can learn to co-operate with your family by going to some nursing homes. Sometimes in a family there are twins or triplets. When people die in your family it is very sad and you don't get over it for a long time. You might not work or go to school for a long time because it is very sad for you. At Christmas, Easter and special events you give your family presents. (Girl, Grade 5)

ANALYSIS OF THE CHILDREN'S RESPONSES

Children readily drew on their own family experiences in their descriptions but often used those personal examples as starting points for the more general pictures they attempted to paint. As the examples included in this paper suggest, most children tried very hard to explain what they thought a family was, rather than to simply describe their own families.

The categories I used to group the children's descriptions of families arose from a content analysis of all the written responses. Their descriptions were analysed according to the concepts they referred to. More references were made in descriptions to the *emotional content* (such as love, care, sharing, belonging) of families than to other content such as family *structure* and *doing things together*.

FAMILY FIGHTS

The children wrote with optimism except when they referred to *family fights* and to *family breakdown*.

> A family is a few people who go shopping and they buy food and they fight and they go to bed. (Boy, Grade 2)

> To me a family is a group of people who love you and care and if we are in trouble they help us out of it and they share things. Of course we have fights sometimes but we make up. (Girl, Grade 5)

> A family is when you are all related. I hate when my sister causes trouble and I get the blame. My mum goes to work. When she comes home she is all cranky. She goes, "Bill at work says Do you want to work on Saturday? and I say No and he says Bad luck." Then she starts complaining to my dad. My family is big now when my sister and her husband and their kids come over. When they come in, I say, "Let me hold the baby." When I helped my sister change the baby's nappy, boy, did I get a surprise. My brother-in-law always hits me for nothing so I tip a bit of the baby's milk on him so he kills me. My younger sister starts crying when I hit her and my mother says, Poor Baby. It makes me sick when my sister eats everything out of the fridge and there's nothing for me. I like it when we go to my cousin's house and we eat over there. I like playing my cousin's drums. When my dad and I go shopping, he goes Slow Down when I push the trolley. Then when he hits me in the head, I get sick when he says Never Learn. I like it on Christmas Day when we open the presents. (Boy, Grade 5)

Significantly more Grade 5/6 children compared with Grade 3/4 children, and girls, compared with boys, indicated that they considered *family fights* inevitable. Grade 3/4 children were more inclined to indicate that they thought families should not fight.

ALTERNATIVE FAMILY STRUCTURES

In investigating subjective and objective definitions of family offered by children, Funder (1989) discerned the impact of parental separation and divorce in the detail of the responses of children with experience of these. It is of interest in this study that only 92 references were made to parental separation and divorce in responses to the open-ended question, "What is a family?" and 49 of the 1030 children expressed acceptance of alternative family structures and of parental separation, divorce and remarriage.

> To me a family is two different sexes taking care of some children and trying to always stay as a group and not to split up. (Boy, Grade 6)

> A family is to me a group of people and put together to care for each other and love each other and belong to one another. Most people become family. Sometimes a family breaks up like divorced so the mother and father aren't family anymore. (Girl, Grade 4)

Grade 5/6 children made more references than did Grade 3/4 children to "proper" (intact) families but Grade 5/6 girls wrote more positively than other groups about "non-standard" families. Here, they wrote of *love* transcending mere structure.

> A family is a mother and a father. Some children too. It is people that are related and close together. If you have a family you may have a family tree. All the people on it are in your family. (Girl, Grade 5)

> A family is a group of people made up of children and parents. (Boy, Grade 5)

> To me a family is a household that not only lives with one another but loves one another for what they are inside. And it doesn't matter whether you're rich or poor. With a family you should always try and understand other people and try and sort out any problem. (Girl, Grade 6)

> A family is someone that is married and has kids. The two parents live together and get on well and are very close. If all your relatives died you would have no family and when the parents aren't together it is hard for the children. Some parents go to court for their children and break the children's hearts. Some married couples haven't got children and the most frightening thing is when the parents fight and if your children are older than about four it can break their hearts and it's not fit for a single parent to get drunk after work and stay with her friends while her kids are getting babysat and I think if anyone has kids they should be able to see the other parent. Don't shout at your children and don't have a baby until you're sure you can look after it and the worst thing is if you split your children and I think instead of putting your kids in a home you should give them to your grandmother or something. (Girl, Grade 4)

Compared with their references to other content, girls made significantly more references to *emotional content* than did boys. These gender differences were more marked at Grade 5/6 level than at Grade 3/4. The emotional aspects of families to which girls referred significantly more often than boys were *love, care, sharing/belonging, understanding problems/talking*. In contrast, boys and younger children (Grade 3/4) referred significantly more often than girls and older children (Grade 5/6) to *family structure*.

> A family is a brother and a sister and a mum and a dad. (Boy, Grade 4)

In contrast with references to family structure, an abstract concept such as *trust* was mentioned significantly more often by Grade 5/6 children than by Grade 3/4 children. *Respect* was mentioned most often by Grade 5/6 boys; *kindness* was popular with Grade 3/4 girls and *sharing and understanding* and *talking about problems*, with Grade 5/6 girls.

Compared with Grade 3/4 children, Grade 5/6 children wrote more frequently of families "sticking together" and of family

members relying on each other.

> A family is when we stick together. A family is when we share things. Family is when they love you and never forget your birthday. (Boy, Grade 4)

Overall, children described families as special and beyond the material world. This finding is similar to that of Goodnow and Burns (1985) who found that children most valued families because of the sense of "being together", "belonging to a larger group of relatives" and of an "unshakeable bond".

The sense of togetherness, alluded to by the children in the Goodnow and Burns (1985) and Ochiltree and Amato (1985) studies, is clear too. While children refer to the more fundamental family behaviour of "*doing things together*" (185 references), they refer frequently to less tangible qualities of family *sharing/belonging/not feeling alone* (101 references) and to "*sticking together*" (67 references).

> A mother, father and children can go on picnics and to the park and take them on the rides and then go home and have tea and if they've been good they get some dessert and watch some video and go to bed at a reasonable time. (Boy, Grade 6)

BOY MEETS GIRL...

Stereotyping was visible in the romantic notions of boy meets girl/marries girl/has babies/lives happily ever after picture present in 74 of the 1030 descriptions of families. Romantic notions of this sort were found more frequently in the responses of Grade 5/6 children than of Grade 3/4 children. Likewise, more references were made by the older than by the younger children to stereotyped parental roles.

> A family is when people come together, meet, get married and have children together, live together and be happy. (Girl, Grade 4)

> A family is when a female and a male get together and know each other for awhile then they get married. When they get married they get children. It could be a girl or a boy and when it's ten they let him or her go to his or her friend's place to play. Then the boy or the girl comes home and stays with their parents. The parents buy the clothes for the baby and the grownups too. The male works and brings some money for the family. The female just cleans up and makes things to eat for the family. The male brings some money and spends it wisely. (Boy, Grade 6)

> A family is when a man loves a woman. They unite, have kids. They give them a good education so they can take off in life like their parents. (Boy, Grade 6)

> A family is when someone gets engaged and then gets married. Then the female borns a baby. Then the female is a mother and the male is a father. Then it's a family. Then the family buys a house to live in all together. Then the father buys a car and gets work so he can give the money to his wife and then the wife will go shopping so they can eat. Then they buy furniture. (Boy, Grade 4)

Another aspect of stereotyping worthy of comment is the use by children in their descriptions of families of dated terminology such as "sticking together through thick and thin", "a roof over your head", "nourishment" and "shelter".

> I think a family is people who share their problems with each other, share their problems, feelings, thoughts. Families are to help you, care for you and to love you. Families are there to feed you. To put clothes on your back and to shelter you. (Girl, Grade 5)

> A group of people who love and care for you and pay the hospital bills and let you get your hair spiked and give you clothes and give you shelter from rain and give you an education. (Boy, Grade 4)

These findings are in line with suggestions by Edgar (1982) and Goodnow and Burns (1985) that children are moulded by parental example and that they call to mind platitudes about families when required to answer questions about them. Goodnow and Burns (1985) referred to children in their study of families "expending a great deal of effort in searching for an explanation and mixing ideas that are handed down with some ideas of their own." (p.33)

However, my research revealed that children were generally wide-ranging in their responses to questions about families and that their own families, when reference was made to them, were most often used only as starting points for more general observations. This is in accord with the findings of Ochiltree and Amato (1985), that although children see their parents in traditional roles they are much more aware of family issues than many parents realise.

> Well a family is something when you always stay together and do things together. Your mum stays home or goes to work or your dad stays home or goes to work while the kids stay home and/or go to school. Soon as the kids get older they find jobs or have their own shop or other stuff. Mum and dad get paid every week and they pay off the bills and with the money that is left over you go shopping and buy stuff. Sometimes you go out like a family and have dinner at McDonalds or somewhere like that. Or when people ask you to come to tea you go as a family. Sometimes families just stay home and watch TV all night and then they go to bed. That's what my family is and yours. (Girl, Grade 6)

> Families are like a bunch of bananas; they always stick together no matter what. Like if one of their children had Aids what would the parents do? They would be right along with the child, go through the rough times. (Boy, Grade 5)

> I've got two families; one in Melbourne and one in Queensland. I don't like my stepfather. I like my real dad better. Now I've got four sisters and one brother and a baby. I think that's too much family. (Girl, Grade 6)

> Just say you were born in 1978 by "Terri" and she's 19 and then one year ten months later she gets married and then three years later your parents split up and have a divorce and then two years later your mum gets married again and two or three years later they get divorced and then your mum finds another man that they're living with now. That's two unhappy families and one still living. (Boy, Grade 5)

FACT OR FICTION?

Attention to children's interpersonal understandings is imperative. Such understandings are integral to their development as fully functioning human beings equipped to live within a changing social context. A paradox revealed in my study is the tendency for some children to reveal both wisdom about the complexities of family functioning and preference for the status quo in family structure and form. It is likely that the responses of the children are characterised by similar pressures from "real" and "unreal" perceptions as was the memory that Anne Deveson had long held of her family. In *As the twig is bent* (1979), Anne Deveson remarks with some surprise that she had always remembered her family in terms of particular behaviour which did not exist but which in her mind had come to represent the more intangible sense of warmth she had experienced in the family. A subtle balance between fact and fiction may affect what children and adults draw from their observations and experiences of families. Quoted in *As the twig is bent*, she states:

> I was really not conscious of having an unusual childhood, with my parents absent so much of the time until one memorable day when I was walking through Kings Cross when I was working at the Commission I realised that I had always thought back on my

> both from Nanny, who was always there, and from an enormous amount of warmth from my mother who I always knew was going to be there. I knew that she came back on weekends and that when she did I would have cuddles in bed with her and go for walks with her and have fun with her. We also had a number of aunts, uncles and cousins around and there was a lot of happiness around the house, which I think is what had always given me a feeling that I'd had a far more conventional childhood than in actual fact I did have.

In this seemingly simple statement, Deveson exposes the tension between the fact and fiction in her perceptions of her family life. It demonstrates too her tendency to ascribe "real" feelings to "non-real" events. Additionally, Deveson bases her interpretations of roles and relationships in her family on a picture she holds of soup and kitchen tables. The interchange between thoughts and feelings in Deveson's description is clear and demonstrates the richness of emotional and intellectual content in perceptions of families.

Overall, gender appeared to be more powerful than age in differences in children's responses to the question "What is a family?"

The opportunity for boys and girls to reflect on aspects of family relationships as part of school programs could constitute a starting-point for the development of shared perspectives about the families of the future. In his paper, *The school's role in promoting family life*, Edgar (1990) suggested that through facilitating their students' understandings of family life, schools are both enhancing the *fabric of society* and the personal development of the students. This is the view reiterated in the 1994 International Year of the Family Report.

SOME SUGGESTIONS FOR TEACHERS

The question "What is a family?" opens the way for considerable classroom discussion. Students may be invited to brainstorm or to write responses. A concept mapping exercise could follow which draws out categories such as love, doing things together, family structure, sharing, belonging, fighting, security.

Many of the children's comments reproduced in this paper can be used as starting points for discussions.

Inviting students to consider questions such as those below may enable them to focus on some of the complexity of family relationships:

- What are some happy things about a mother moving from the children's home to live somewhere else?
- What are some unhappy things about a mother moving from the children's home to live somewhere else?
- What are some happy things about a new baby in the family?
- What are some unhappy things about a new baby in the family?

Literature is filled with extracts like the one below which provide excellent opportunities for exploring family related issues:

> An hour later, I was home, having spent my precious money on four peaches. After some considerable thought I arranged them on Matilde's christening plates and waited for mother to return. ... As I met her at the entrance to the kitchen, I almost pulled her inside the door, I was so eager to show her the peaches.
>
> "Amelia, what have you done? You've gone and bought peaches and I haven't got enough money to buy salt for the soup."
>
> Her face coloured from rosy pink to red as she shouted at me. I felt the tears come stinging to my eyes. She threw the wood aside, stood only inches away from me, her arm outstretched, her hand open.
>
> "How could you?" she screamed. "How could you waste money like that? Peaches, who cares about peaches?"
>
> I winced from the pain of the cracking hand that burned through my dress and between sobs tried to explain they were for her.
>
> .... Yet in another way I understood mother's reaction. It was poverty. Never having enough food, always patching and repatching our clothes, knowing we were all too thin, wishing she had more money for food, to give us more to eat, knowing it was impossible. That's what made her act in this way. She didn't want to beat us. She just could not help it."
>
> *Amelia – A Long Journey* by Maria Triaca

There's much food for thought and discussion too in the ways in which romantic views of family life persist and in structural aspects of families, for example, names, responsibilities.

The meaning of membership of the Australian family for citizens of the year 2000 warrants attention as well.

NOTES

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The research reported here is more fully described in:

Ryan, M. (1991). *Children's perceptions of changes in families*. Unpublished PhD thesis.

That children have the right to a broad family education is stated by:

Asche, A. (1982). *The rights of the child. Discussion Paper Number 5*. Melbourne: Australian Institute of Family Studies.

Creating the links: Families and social responsibility. Final report by The National Council for the International Year of the Family (1994). Australian Government Publishing Service. (page 284)

Definitions of family and the impact of parental separation and divorce on children can be found in:

Funder, K. (1989). *Family configurations: Post-divorce insights from children*. Paper presented at the Third Australian Family Research Conference, Ballarat.

For other studies of children's perceptions of families see:

Goodnow, J. & Burns, A. (1985). *Home and school: A child's eye view*. Sydney: Allen and Unwin.

Ochiltree, G & Amato, P. (1985). *The child's eye-view of family life*. Melbourne: Australian Institute of Family Studies.

That children are moulded by parental example is from:

Edgar, D. (1982). *Facing up to family change*. Paper presented at the Education Department's Counselling and Clinical Services Conference, Melbourne.

Goodnow, J. & Burns, A. (1985), see above.

Anne Deveson's quote is from page 84 of:

Lane, T. (1979). *As the twig is bent: The childhood recollections of sixteen prominent Australians*. Melbourne: Dove.

The value to schools of facilitating their students' understandings of family life is expanded by:

Edgar, D. (1990). *The school's role in promoting family life*. Paper presented at IARTV/AHISA Seminar, Xavier College, Kew.

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set two, 1996

HOME-BASED EDUCATION

ROLAND MEIGHAN *University of Nottingham School of Education*

Yehudi Menuhin went to school for one day. Although he said he did not dislike it, one day was enough and the rest of his education was home-based. This kind of approach, adopting the home-based education option, has been taken up by more and more parents in a variety of countries over the last 20 years.

Partly because of its low profile as a grassroots development, the actual *significance* of home-based education has hardly begun to be recognised, for it lays open to question all the basic assumptions of the present schooling system.

EDUCATION OTHERWISE

Most people in the United Kingdom have come to believe that schooling is compulsory and are often taken aback to find that they are quite wrong. The families concerned get rather tired of quoting the law which states that:

> It shall be the duty of the parent of every child of compulsory school age to cause him to receive efficient full-time education suitable to his age, aptitude and ability, either by regular attendance at school or otherwise.

The law is clear: *education* is compulsory, schooling is not.

In 1976 a self-help and mutual support organisation was set up for parents in the United Kingdom who choose this unusual form of education: it took its name from the clause in the Education Act and was therefore entitled Education Otherwise.

In the United States over a million families are reported to be "home-schoolers". In the United Kingdom the number of families opting for home-based education has grown from about 20 families in 1977 to approaching 10,000 in 1994. In Australia 20,000 home-based educators are reported, including those using the radio schools system for children in the remote Outback areas of the country. In Canada, 10,000 are officially known and 30,000 estimated as the real total. In New Zealand the figure quoted is 4000. In all cases these figures have been rising steadily over the last 20 years and continue to rise. Every time the subject appears in a newspaper article or is the subject of a radio programme or is featured in a television programme more people come on board, convinced that this option is worth trying to try to solve their educational difficulties or dissatisfactions. They are surprised to find not just that it works, but that it works very well.

The central research question about home-based education has changed. In the 1970s it was about whether children who were educated at home would be able to match their school-based counterparts. Since about 1985, however, the question has become:

> Why is home-based education so remarkably successful, and what is it about present models of schooling that holds back the learners attending them full-time, both in learning achievements and in social and emotional maturity?

My own further question has been:

> What can we learn from the efficiency and effectiveness of home-based education to construct a new and better learning system?

Conclusions about the effectiveness of home-based education can be drawn from a variety of research methods.

CASE STUDIES

- Home-based education could be considered extremely successful, judging by the achievements of some well-known people who have been educated in this way: Yehudi Menuhin, Patrick Moore, Agatha Christie, Margaret Mead, Thomas Edison, George Bernard Shaw, Noel Coward, C. S. Lewis, Pearl Buck, Bertrand Russell and John Stuart Mill.
- There have been documented cases of the academic successes gained by home-based students, for example various 13 year-olds who have been admitted to British universities.
- Reference can be made to the crucial court case, Harrison versus Stevenson in 1981, that led to the judge deciding that the Harrison family's home-based education was a success:

> They are mature, confident and at ease in all sorts of company. They are lively minded, have a good general knowledge and are intellectually athletic.... In their case their education – in its own field – has proved and is proving, a marked success.

"In its own field" meant that the Harrison family had elected for autonomous education based on practical and self-sufficiency skills, rather than an academic approach.

- Another source of reference is that of the presence in the ranks of the home-based educators of so many members of the teaching profession – at least 25 percent of the cases at any given time, and currently about 33 percent in the United Kingdom – who have decided that home-based education provides the best option for their own children.

SYSTEMATIC STUDIES

The issue of social skills. Two recent research reports on the issue of social skills found that home-schooled students received significantly lower problem behaviour scores than schooled children; and that home-schooled children are socially well adjusted, but schooled children are not so well adjusted. This leads to the conclusion that we are asking the wrong question when we ask about the social development of home-schooled children. The real question is why is the social adjustment of schooled children of such poor quality?

Some possible reasons emerge from these studies:

- The classroom is mostly one-way communication, often of a stilted kind, and few meaningful interchanges are in evidence. In home-based education the opposite is the case.
- Schools are products of the factory age, with batches of uniform products running on the conveyor belt in lockstep motion towards the standardised diploma. It therefore socialises into this kind of mentality. Home-based education, in contrast, works to more personalised educational outcomes.
- An unnatural aspect of school is age segregation. Learning to get along with peers alone does not prepare students for varied interactions with older and younger people in life. Home-based education avoids this trap for in the home-school learning programmes people of various ages are encountered in a way that more accurately mirrors the variety of society.
- The emphasis of home-based education on self-discipline and self-directed learning and the personal confidence this produces creates young people who can adapt to new situations and new people.

The issue of intellectual and academic development. The academic excellence of home-schooled children has been repeatedly demonstrated in the research in the United States. In summary, recent studies from the United States put home-schooled children at least two years in front of their schooled

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counterparts in intellectual achievement and sometimes as much as 10 years ahead. The evidence from systematic studies in the United States and case studies in the United Kingdom supports this view.

Competence in science. Hornick (1993) studied a group of seven families with teenage children in Massachusetts to find out how science was learned in home schools. He found that the parents in the sample (whose own backgrounds in science were slight) did not teach science to their teenagers, the teenagers taught themselves. The result was "inquiry science of the very highest quality". The students performed as real scientists in exploring phenomena, making hypotheses, designing and carrying out tests, and analysing and evaluating results. Memorising texts and doing worksheets was not in evidence, but textbooks were used as a source of ideas and reference.

Parents operated with a sense of the "teachable moments" when their teenagers' interest and curiosity had been aroused. Every family agreed that locating suitable resources was the key to their science learning and this was the justification for the extensive use of television and field trips.

Hornick's assessment of the scientific knowledge and understanding gained was that it was of the highest standards, but that the families were largely unaware of this and rather took the quality of their learning for granted:

> When I asked 13-year-old Louis what science he knew, he neglected to mention that he is an expert at identifying medicinal herbs and preparing oils and tinctures: for him this was his small business not science.

Competence with computers. The study by Marchant (1993) of the use of computers by home-schoolers found that 185 families from 37 states were exchanging ideas and information regularly, without ever physically meeting. The characteristics of this group were analysed without any assumption being made that they were typical of the general population of home-schoolers. Marchant found that this group were knowledgeable and sophisticated. The parents were a fairly well-educated group who felt that their own formal education had contributed little to their success as home-educating parents. They were well equipped in terms of modern computer technology and know-how and even though they tended to downplay the importance of this, the impact on the competence of the children was hard to ignore.

Marchant notes that negative experiences with schools had left many of the parents in his sample discouraged and angry. They were unresponsive to suggestions that schools could be improved.

Research from Canada. A 1993 state-by-state survey of home study in Canada, involving responses from the Deputy Ministers of Education and the 30 home-schooling associations, found that home-schooling was firmly entrenched and officially recognised as an acceptable educational option. Estimates from the records of the associations suggested there are likely to be 30,000 home-schooling families, with diverse backgrounds:

> ... housewives, teachers, doctors, back-to-the-landers, lawyers, francophones, anglophones, fundamentalists ministers, farmers, and just plain parents, of all faiths and creeds. All of whom are united in one common belief: they are concerned about their children and their children's education. Concerned enough to do something about it themselves. (p. 15)

A United Kingdom study of learning methods. Alan Thomas's research involving 23 families in the Greater London area (and a sample of families in Australia) explores how the home-based children learned. Observations were mainly undertaken in the kitchen, where so much home-based education, in the form of conversations, takes place, and were recorded with pen and paper. The qualitative data was subjected to content analysis to identify emergent themes.

Families starting out on home-based education who at first adopted formal methods of learning found themselves drawn more and more into less formal learning. Families who started out with informal learning at the outset found themselves drawn into even more informal learning. The methods that both groups grew into had much more in common with the methods of younger children. The sequencing of learning material, the bedrock of learning in school, was seen increasingly as unnecessary and unhelpful.

Learning to read was a central concern, but parents showed less anxiety when their children showed no inclination to learn at the usual age.

> Curiously, these children who learned to read relatively late still went on very quickly to read material suitable for their age. Most of the children were voracious readers.

Thomas stresses that his work is in the early stages and should not be regarded as the last word on the matter. Nevertheless, he is already aware that his research challenges one of the fundamental assumptions of schooling.

> This study challenges the almost universally held view that children of school age need to be formally taught if they are to learn. In school this may be the case but at home they can learn just by living.

A PERSONAL REVIEW

Researching home-based education has been a remarkable experience that has helped me personally to review most of my assumptions as a practising teacher about educational matters. Some of my personal conclusions are as follows:

- Diversity in education is likely to be healthy because:
  - individuals and families differ;
  - circumstances are different;
  - successful education can take many forms.

  (Therefore *always* suspect regimental "answers", such as the "answer" of a British National Curriculum or "salvation by phonics" or "salvation by testing".)
- Wounds can heal and children can recover from bad learning experiences, especially in the supportive environment of a concerned family. I have witnessed this too many times to think it is an unusual event (see also Holt, 1982).
- It is actually hard for a school as currently organised to match an alert, organised and energetic family. Only a few schools even get near it, as I was able to observe as I went from studying home-educating families to supervising students in school and back again for over 10 years.
- Flexible learning (and as a result the production of flexible people) is currently more likely to be found in home-based education.
- Learner-managed learning (autonomous education) is at present more frequently found in home-based education: schools tend to focus on "how to be taught", whereas homes tend to teach "how to learn". Schools, therefore, tend to teach you to be stuck with the gaps in your knowledge, homes how to fill them (Meighan and Meighan, 1991).
- Confidence-building is currently more likely to be found in homes.
- Non-sexist education can be achieved more easily at home than under the present models of schooling.
- The habit of peer-dependency and the "tyranny of the peer group" produced by school operating the current officially approved model can be reversed by home-based education.
- The rotation and alternation of a variety of types of curriculum is commonplace at home, but currently much rarer at school.
- Schools at present tend to focus on one-dimensional education, homes more frequently develop multi-dimensional education.
- Co-operative and democratic forms of education are more likely to be found in home-based settings, because of the dominance of the authoritarian school management model, as portrayed in Davies (1994).
- So-called "school phobia" is actually more likely to be a sign of mental health, whereas school dependency is a largely unrecognised mental health problem.

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- Homes are more likely than schools to achieve "The child in pursuit of knowledge and not knowledge in pursuit of the child" (George Bernard Shaw).
- A few families have one child in school and another out, with options to change in either direction based on experience and needs. They are pioneering a more flexible form of education. A positive way forward for the schooling system is to take up the idea derived from home-based educators of flexi-time and ultimately flexi-schooling (Meighan and Brown, 1980).

AN OFFICIAL VIEW

A letter from the Boston University undergraduates admissions director proclaims:

> Boston University welcomes applications from home-schooled students. We believe students educated primarily at home possess the passion for knowledge, the independence, and self-reliance that enable them to excel in our intellectually challenging programs of study.

A SCHOOL PUPIL'S VIEW

> Dear Education Otherwise,
>
> My best friend is Susan and she doesn't go to school; she is taught at home by her parents and is more interesting than someone that does go to school because she knows a lot more.
>
> I sometimes feel a bit jealous of her, because she is more educated than some of my other friends and myself. At school there are quite a few bullies, but Susan doesn't have to worry about things like that. Sometimes I wish I was educated at home as well as Susan and her brother, Paul, as they can spend more time with their parents and pets.
>
> At school, you hardly use a computer, but Susan and Paul nearly always use a computer and are shown how to use one properly. They are always learning about new things – at school I always learn about the same things over and over again!
>
> Some teachers are hard to get on with and you don't get any encouragement from them, but your parents always give you encouragement.
>
> (Carol Ann, aged 12, Bolton)

WHY DOES IT WORK SO WELL?

NATURAL LEARNING AND "DOVETAILING"

Families educating at home often engage in highly sophisticated activity, without necessarily being able to articulate what they are doing. Most parents find that young children are "natural" learners. They are like explorers or research scientists busily gathering information and making meaning out of the world. Most of this learning is not the result of teaching, but rather a constant and universal learning activity, "as natural as breathing". Parents achieve the remarkable feats of helping their children to walk and talk by responding to this process. This is perhaps the most successful example of educational practice world-wide. In the first five years of life, astonishing learning takes place as a non-verbal infant learns its native language, to walk and to achieve competence within its home and local environment. All this achieved, with varying degrees of success, by so-called amateurs – the parent or parents and other care-givers, such as grandparents.

The highly sophisticated activity of parents is described as "dovetailing" in to the child's behaviour. Parents appear to have no pre-determined plan of language teaching, they simply respond to the cues provided and give support to the next stage of learning as the child decides to encounter it.

DIFFERENT FORMS OF DISCIPLINE

In some situations we need to be able to cope with *authoritarian discipline* and behaviour either by taking a lead or taking instructions. At other times we need to co-operate with others and behave with the *democratic discipline* of evolving and agreeing rules and then implementing and policing them collectively. Sometimes we need to be self-directing, take decisions for ourselves and act with *autonomous discipline.* Sometimes we need to have memorised information using subject disciplines and at others to know the discipline of how to research. It follows that an effective education requires experience of all these approaches and an awareness when each one in turn is appropriate.

The experience of families educating at home has demonstrated how this can be achieved. The learners sometimes direct their own studies. At other times they work in co-operation with others and on other occasions decide to submit to instruction. The parents occasionally act as instructors and at other times as facilitators, sometimes as co-learners and often as sources of encouragement.

VARIED LEARNING STYLES

Human beings, adults and children alike, differ from each other quite dramatically in learning styles. To date, 32 such differences have been catalogued. An example would be the difference between those who learn better with some background noise and those who learn better in quiet conditions. Individuals also differ in the kind of light conditions, temperature conditions, bodily positions, food intake and type of companions needed for efficient learning. Bio-chronology is another factor, for some are early-day learners and some late-day or even evening/night learners.

Therefore, the situation in which one teacher faces 30 children in one room and is required to deliver the same material within a given period of time, say 45 minutes, to all of them, means that drastic harm to the quality of learning of many of the class and the resultant loss of a great deal of potential learning is inevitable. In contrast, in the home-based education I have witnessed the families rather take it for granted that learning styles differ and vary the learning situations accordingly.

THE FLEXIBLE USE OF CURRICULUM TYPES

At least six different types of curriculum can be identified. They are the imposed subjects, the imposed interpretative, the imposed confidence-building, the consultative, the negotiated, and the democratic. The logistics of each of these types has been outlined elsewhere (Meighan, 1988).

Some families operate a flexible curriculum in terms of including several of the above six types in their programme. Often the morning programme may be imposed and pre-planned, sometimes to satisfy the wishes of the Local Education Officers, sometimes for external examination purposes and sometimes for the family's own reasons. The afternoon programme may then be of another kind, consultative, negotiated or democratic in co-operation with another family. These families have pointed the way to a more flexible approach to the curriculum by operating with several types, rather than limiting themselves to one approach.

An essential part of the approach of the families working in these flexible ways is the regular monitoring and evaluation of their curriculum. In some cases I have seen this taking place regularly and deliberately at morning coffee breaks, supplemented by reviews at meal times. In other cases the planning and review has taken place in a regular Sunday evening meeting to decide the learning programme in outline for the following week.

EFFICIENT USE OF TIME

When I have interviewed children who have come out of school into home-based education I have asked them to compare the two experiences. Usually the first response is the comment on efficiency of learning. They say that they have frequently learnt more by coffee-time at home than in a whole day at school, so that the rest of the day is "additional learning". This helps explain why children who are "behind" at school soon catch up at home, and also why they can end up two-ten years ahead of their schooled counterparts.

A NON-HOSTILE LEARNING ENVIRONMENT

It is not just efficiency that the children note. They have told me about the relaxed atmosphere at home, which encourages them to be increasingly confident in taking over the management of their own learning. When they started school at five years of age, we know they were asking about 30 knowledge or enquiry questions an hour (Wells, 1986), but that this soon drops and eventually gets to around zero. In the non-hostile home-based education, they tell me, their interest in learning and curiosity and questioning begins to build up again.

DIRECT ACCESS TO AN INFORMATION-RICH SOCIETY

When schools were set up we lived in an information-poor society. Therefore, getting children together in one place to give them access made some kind of sense. Now that we live in an information-rich society, it makes little or no sense, as Richard North observes:

> We no longer have to force-feed education to children: they live in a world in which they are surrounded by educative resources. There are around 500 hours each of the schools television and radio every year in this country. There are several million books in public libraries. There are museums in every town. There is a constant flow of cheap or free information from a dozen media. There are home computers which are easily connected to phones and thus other computers.... There are thousands of workplaces.... There are ... the old, the disabled, the very young all in need of children in their lives, all in need of the kind of help caring and careful youngsters can give, and all of them rich sources of information about the world, and freely available to any child who isn't locked away in school. (North, 1987)

LEARNER-MANAGED LEARNING: PLAN, DO, REVIEW

The success of the Ipsilanti High Scope programme has been widely published. Children in schools using this approach are encouraged in the basic skills of deep learning, that is, they learn to plan, do and review. What has been overlooked is that home-based education usually operates to the same principles and is therefore equally successful in producing competent and confident learners. By adding the efficiency factor mentioned above, however, the home-based pupils are likely to pull ahead.

ADULTS AS LEARNING COACHES

When adults quiz the parents about home-based education they often ask how one or two parents can replace the team of experts of a school staff. Apart from pointing out that we live in an information-rich society anyway, parents describe themselves as "fixers" or "learning site managers", who help arrange the learning programme and may often operate as fellow learners, researching alongside their children, rather than as instructors.

PLENTY OF FIRST-HAND EXPERIENCE

As the research studies quoted earlier indicated, in computers and science explorations, as well as other learning activities, home-based education assumes that large amounts of first-hand experience are essential to effective learning.

CONCLUSION

There remains the question of whether home-based education can go wrong. For example can it become stultifying? If it falls into the same trap as the typical school curriculum in promoting one of the first two of the six types of curriculum as the *one right curriculum approach*, the answer is "yes". Families who follow too slavishly or too exclusively set programmes purchased from some agency run this risk. The cases of families adopting narrowly-defined religious curricula have raised such anxieties. I have not witnessed any myself, as yet, but others have.

Provided families stay flexible, recognise that each of the six types of curriculum may have a modest part to play in the scheme of things, and do not forget the logistics of the most successful educational programme in the world, that is, the home-based nought-five years curriculum, they will avoid the trap.

The lessons of this research, as to how the schooling system could be regenerated, are only just beginning to be appreciated. The United Kingdom organisation Education Now Ltd, a non-profit making research, writing and publishing company, set out in 1988 to attempt to apply the research in the development of a more flexible and open learning system of education to cope with the wide diversity of learner styles and social and employment situations. The co-operative has published over 20 books to date, engaged in consultancy in the United Kingdom and elsewhere and mounted several conferences. The overarching concepts for the work of Education Now are those of flexi-schooling, flexi-time and flexi-education. A key institution in a more flexible system will be the Invitational School, to replace the Custodial School. The result promises to be an administrator's dream: a system that gives higher quality at lower cost.

NOTES

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This is an edited version (reprinted with the publisher's permssion) of:

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AL SKILLS FOR LEARNING

KEITH HOLLAND

Optometrist, Cheltenham

Research has shown that in every class there are at least five children with visually related learning difficulties. Keith Holland sheds light on the possible causes of such problems, explains how to recognise their symptoms, and outlines the means to overcome them.

The classroom teacher standing before a room of bright, young children assumes for the most part that those children are fully equipped with the tools needed to help them learn. The child with a broken arm stands out from the rest, and receives the sympathy that is their due; the deaf child is likely to be seen and helped; and the child with partial sight is also likely to be noted, and helped. There is, however, a group of children thought to be far larger than any of the preceding groups who are rarely noticed, yet who are likely to be penalised for their very real but unrecognised handicaps: they are the children with visually related learning difficulties. Extrapolation of population studies suggests that in every class there are at least five children with such difficulties. Unless their difficulties are recognised and addressed, they may eventually exit from the educational system having seriously underachieved relative to their potential, and may have suffered much distress as a result. This blow to confidence may remain with them throughout their adult life, affecting many apparently unrelated areas of their lives. As teachers, you have the opportunity and responsibility to recognise such individuals, and try to guide them towards appropriate help and relief. This short article is aimed at helping the classroom teacher understand the possible visual causes of such problems, together with their symptoms, and the means available to overcome them.

Before looking at the visual skills needed for learning, it is worth understanding something of the terminology used.

TERMINOLOGY

Vision refers to the total system that allows an individual to see, and to experience objects and images in space. A small part of this system is the eye, the rest includes all of the complex neurological processes that go to convert a light impulse reaching the eye into a meaningful mental image of the world we are in. Many make the mistake of saying a child's vision is all right when they really mean that the child's eyes have normal optics, and can receive a sharply focused image.

Refractive error refers to the lens power required to produce a perfectly focused image on the retina of the eye. This is normally what is assessed in a routine eyesight test, and corrected by means of spectacles.

There are three components to stable vision that together produce a mental "space map" of the world we see, whether it be the world of the sports pitch or the world of the novel. Those three processes are: *vergence*, *focus*, and *eye movement* (sometimes erroneously called "tracking").

Vergence is the term referring to the movements of the eyes relative to each other, that ensure they are always looking at the same point in space. In particular, *convergence* refers to the turning of the eyes towards each other as they look at an object that is near to them. Difficulties may exist with the vergence system making it difficult for the eyes to converge adequately. A child with these difficulties may well experience dull headaches, become very tired with quite short periods of close work and may quickly lose concentration on the task in hand, often being easily distracted by movement around them, and looking up from the task. They may day-dream a great deal, and may have difficulty in completing work on time.

Children who over-converge may show a tendency to move in towards their work, perhaps laying their head on their arm, their eyes sometimes being only a few inches away from the page. These children may experience migraine, often nauseous. They may be oblivious to distractions around, preferring to plod sequentially through an activity, even though they may be doing the wrong task to begin with, having misread the question and not seen the detail of the question in relation to the whole problem. Often their handwriting will be very small and precise, although not necessarily tidy. They may well press very hard, and imprint several pages on their books.

Some children will show evidence of both problems at different times, initially starting off with poor convergence, but making so much effort to "get things together" that they end up over-converging.

Closely linked to the vergence system is the *focus* (or accommodation) system. This serves to adjust the focus of the lens inside the eye to give a sharp picture of the subject that we are looking at. Two properties of the focus system can break down. First, the eye may simply not focus closely enough: this lack of focus amplitude means that we may be working close to the limits of our focus system, and we will have difficulty maintaining this for sustained close work without fatiguing, yawning and becoming sleepy. Second, there may be difficulty in switching focus from one distance to another – the focus facility may be slow. This may lead to difficulties in copying materials off blackboards or overhead projectors. A child who additionally has short-term visual memory difficulties may be particularly vulnerable to this type of problem.

As the eye adjusts focus, it automatically adjusts convergence, and if the relationship between the two systems is not working well, there may be increasing stress, leading to difficulties in keeping clear focus at any distance. The child with these difficulties will again have problems with concentration, will be distractible, and may suffer from fatigue and headaches.

There are three aspects to *eye movements* skills to be considered. First, can the child keep its eyes still long enough to take in information: in other words, can he or she *fixate* properly? Problems here can lead to distractible behaviour, inattentiveness to near tasks, and hyperactive-like behaviour (although this behaviour should not be confused with true attention deficit disorders, which have a quite separate pathogenesis).

In developmental terms, once a child can fixate, s/he learns to maintain fixation on a moving target – to track or to pursue it. These *pursuit movements* are essential for keeping control of our hand whilst writing, and are a prerequisite for developing the *saccadic eye movements* needed for reading. During the reading process, the eyes move along a line in a series of separate jumps, or saccades, pausing on average every nine letters in an adult reader to take in information. These separate fixation fields overlap, and should be received sequentially to provide a coherent and orderly representation of the material being read. Where problems exist with the saccadic movements, the eyes are likely to move erratically, and show a higher than normal frequency of regressive, or backward, eye movements – sometimes as many as 30 percent of the eye movements made when reading can be regressive. In this situation, the child may have difficulty in keeping his/her place or line, finding it essential to use a finger or card as a marker. Comprehension may well suffer, so much energy going on place-keeping that little cognitive effort goes into understanding the text itself. Needless to say, the individual with these difficulties will find reading a chore that is reluctantly engaged in, and produces little personal reward.

Not only do problems with these physical visual skills affect reading, but they may also affect the development of a child's visual imagery abilities (or *visualisation skills*). The late Professor Elliot Forrest has described four basic systems used for spelling:

- rote learning,
- rules of the language,
- phonetic images, and
- visual images.

When a child is engaged in free writing, s/he will find it difficult to relate to lists of words learnt by rote. S/he may use language rules or mnemonics, but will often be so engrossed in the "plot" that they fail to register. S/he will always have an auditory or phonetic impression of the word s/he is trying to spell, but s/he may not have a visual image available, and in this situation is likely to rely on the phonetic spelling, even though when held up and asked to spell the word, s/he may correctly recall the true non-phonetic spelling.

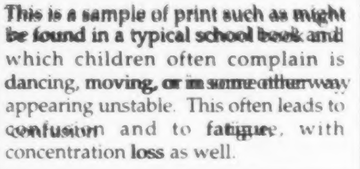
An individual child may show more than one problem area, even though s/he may have normal visual acuity, and be able to "pass" a simple eye test. The classroom teacher is the most likely individual to spot these difficulties, since these children are often reluctant readers at home, and not seen by parents engaged in sustained near-point activities. The teacher should be able to spot the basic symptoms of visual difficulties (as, for example, outlined below). Understanding on the part of the teacher, with simple modifications to teaching techniques, may go some way to reducing the difficulties experienced by the child. Furthermore, the teacher should be able to recommend to parents referral on to appropriate agencies for further investigation.

SIGNS AND SYMPTOMS

FOCUS AND CONVERGENCE DIFFICULTIES

- Transient blurring (or double vision) of print.

Figure 1: Illustration of the possible appearance of a printed page to a child with visual difficulties



This is a sample of print such as might be found in a typical school book and which children often complain is **dancing, moving, or in some other way** appearing unstable. This often leads to **confusion** and to **fatigue**, with concentration **loss** as well.

- Fatigue and tiredness after quite short periods of close work.
- Short concentration spans.
- Variable working distance – often very short.
- Observations of rubbing of the eyes, excessive blinking, grimacing or other facial strain.
- Headaches, usually associated with periods of close work and study, and therefore often towards the end of the school day.

EYE MOVEMENT DIFFICULTIES

- Difficulty in keeping place and/or line whilst reading.
- Improvement in reading fluency if a marker is used (either a finger or card, or both).
- A particular dislike of reading aloud – individuals feeling that they read better silently.
- Poor handwriting (may have many other causes).

VISUALISATION

- Probably the most common sign of visualisation difficulties is a strongly phonetic approach to spelling, with an absence of clear visual thinking.
- Sometimes difficulties in recalling detail of past events is evident, affecting the acquisition of general knowledge.

THE TEACHER'S ROLE

As already mentioned, the teacher is a key member of the team responsible for recognising children with visual difficulties, and use of the symptom lists above will aid in spotting children who need further investigation. But what then? Teachers should be aware of the appropriate referral channels in their locality. This may be through the school eye service, to a local optometrist or to the child's general practitioner. In either case, a short note to the parent highlighting the reason for your concern can greatly aid the professional in knowing what to look for. Many of the signs and symptoms described may not show outside the classroom, especially if the child is reluctant to engage in any close work tasks (such as reading) at home.

Within my practice a checklist is used, as outlined in Figure 2. This allows teachers to communicate rapidly their observations to others – without offence! Although this is a highly subjective approach, it does allow parents and teachers to focus their thoughts on this area of function, and is a screening technique in widespread use by behavioural optometrists around the world. Most of the observations asked for have been shown to correlate to identifiable visual dysfunctions.

FIGURE 2: CHECKLIST OF VISUAL SIGNS

CONFIDENTIAL
TEACHERS' CHECKLIST FOR VISUAL SIGNS

Child's Name .... Form/Teacher Reference ....

1 Please circle the special areas (if any) of difficulty this child has with reading

Vocabulary Word recognition Oral reading Silent Reading Rate
Interpretation Attention Comprehension

2 *Four classifications of frequency of performance traits are given.*

A Meaning very often observed (many times/day)
B Meaning regularly observed (daily)
C Meaning sometimes observed
D Meaning seldom observed

Please ring the letter you best consider indicates the child's performance

Does the child show any of the following?

a.	Skipping or rereading lines or words	A	B	C	D
b.	Reads too slowly	A	B	C	D
c.	Uses finger or marker as pointer when reading	A	B	C	D
d.	Lacks ability to remember what s/he had read	A	B	C	D
e.	Shows fatigue or listlessness when reading	A	B	C	D
f.	Complains of print "running together" or "jumping"	A	B	C	D
g.	Gets too close to reading and writing tasks	A	B	C	D
h.	Loss of attention to task at hand	A	B	C	D
i.	Distracted by other activities	A	B	C	D
j.	Assumes an improper or awkward sitting posture	A	B	C	D
k.	Writes crookedly, poorly spaced letters, cannot stay on ruled lines, excessive pressure used	A	B	C	D
l.	Orients drawings poorly on paper	A	B	C	D
m.	Is seen to blink frequently	A	B	C	D
n.	Rubs eyes excessively	A	B	C	D

General observations

o.	Clumsiness and difficulty manipulating own body and other objects in space available, including problems with ball control	A	B	C	D
p.	Awareness of things around her/him in the classroom to point where s/he turns to look at stimulus	A	B	C	D
q.	Is this child able to maintain her/his involvement with your instruction?	A	B	C	D

Scoring

Any scores of "A", more than two scores of "B", and more than three or four scores of "C" suggests that prompt referral to an optometrist specialising in children's eye care is indicated. A copy of this checklist would also be helpful to the optometrist.

PRACTICAL SUGGESTIONS

But what can be done to help these children in the classroom? It has been suggested by several authorities that simple modification of the daily routine may help children cope better, increase concentration span and allow for greater teachability, by reducing the aggravating factors that precipitate binocular vision breakdown (for a more detailed argument, see Wachs and Furth (1975)).

Research has shown that children have an optimal working distance, correlating with the distance between the middle knuckle of the third finger and the elbow. This distance is quite critical, and a shortening of this distance has been shown significantly to increase the muscular effort applied to close work. It follows, then, that the maintenance of good posture in the classroom is more than a reactionary throwback to Victorian behaviour! It is likely to improve individual efficiency. It is also important to encourage the student to maintain an erect posture, working straight on and not leaning the head too far to one side; this is often a sign that attempts are being made to suppress one eye, usually to minimise symptoms of visual difficulty. A particularly weak area in modern classroom design is seen where children are working in groups around a table. Two difficulties arise from this. First, for children with difficulties in integrating central and peripheral information there is likely to be an undue problem with distractibility; and second, three sides around a table are going to have to turn around in order to be able to see material written up on the board. The child with visually related learning difficulties may well be the one with his or her back to the board, increasing the likelihood of difficulties with this copying task and negating the positive effects of copying as an aid to learning!

Where possible lighting should be natural, and not contain a predominance of fluorescent; children are often unduly sensitive to flicker, particularly if it is in their mid-periphery and, again this can cause difficulties with peripheral/central integration.

The work of Helen Irlen and others has suggested the use of coloured overlays or spectacles as an aid for children with visual perceptual difficulties. Research into the so-called Scotopic Sensitivity Syndrome is controversial, and at the present time no clear explanation for the efficacy of these aids has emerged. Research carried out by myself has shown that children who benefit from such aids are very likely to show clear patterns of binocular vision difficulties, such as described in this article, and it is my own view that they are better helped by referral to an optometric practitioner who is skilled in these areas.

Many optometrists incorporate visual and perceptual training into their care regimes, and a considerable body of evidence exists that this vision therapy can be of considerable benefit to many children suffering from visually related learning difficulties. Programming of vision therapy activities is a

professional function, best left to suitably trained personnel; but none the less, there are numerous simple exercises that can safely be incorporated into classroom routines, or physical activity sessions, that can benefit children with such difficulties. The following are simple activities that can be safely carried out by teachers within the classroom setting as part of routine physical movement sessions:

- Looking up, down, left and right with the eyes only, and no head movement – possibly to the four corners of a room, and in time to a beat, may help stimulate simple tracking skills. Repeat this ten times at the start of a lesson.
- Drawing numbers at random over a blackboard and having a child draw a continuous line to connect them, again trying to avoid head movements. This can also be used to help develop sequencing skills.
- Reading the first and last letters on every line down a page of text, without using fingers to keep place or reading the first letter of every word, can help develop better saccadic eye movements.
- Having two people throwing partially inflated balloons across the line of sight of a third, who has to track the balloon, possibly shining a torch on to it as it arcs through the air.
- Drawing a maze on to thin card, placing a small metal object at the start, and trying to pull along the course from underneath with a magnet may assist in the development of hand/eye skills.
- Having a child read (if not a fluent reader, reading single letters) whilst moving the material in and out, and in circles, can help develop stable focus skills. It also encourages near/far refocusing between targets placed three inches away and targets at a distance. This should only be performed for short periods as fatigue can result.
- Encourage pattern-copying, using increasingly complex shapes as an aid to the development of visual analysis skills. Numerous programmes exist based on the early work of Marianne Frostig; whilst the transfer of these skills was first thought to be limited, more recent research has proven the value of these techniques.
- Wordsearches are useful ways of helping children learn to spot embedded detail (commercial computer software is available to allow rapid generation of "tailor-made" wordsearches directly applicable to current topic work).
- Pattern games such as "Battleships" are excellent ways of encouraging visual analysis – and they may help with National Curriculum mapwork as well!
- When teaching spelling, do *not* rely on simple look-and-say approaches. Try to encourage visualisation by looking, covering, closed-eye picturing, saying or writing down, re-covering, re-drawing and looking again. It sounds a mouthful, but works!
- Encourage day-dreaming! But only if followed by exercises in describing the dreams with as much sensory detail as possible.
- Listen to music with eyes closed, trying to picture the scenes being portrayed. Good pieces for this include: *Carnival of the Animals, Peter and the Wolf, Pictures at an Exhibition,* Beethoven's *Pastoral Symphony.*

Children with visually related learning difficulties are in perhaps the worst position in the class: theirs is truly a hidden handicap. Empathy, understanding and accommodation are all crucial if they are to achieve their true potential.

NOTES

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Holland, K. (1995, Spring). Visual skills for learning. *Topic, 13,* 12.

Very little has been published within educational journals about these areas in this country [the United Kingdom]; the most useful text available, containing a great deal of background theory, and many practical activities for the classroom teacher, is:

Wachs, H., & Furth, H. (1975). *Thinking goes to school.* New York: Oxford University Press.

For a full review of the current state of research in these fields, a useful text is:

Willows, D., Kruk, R., & Corcos, E. (Eds.). (1993). *Visual processes in reading and reading disabilities.* London: Lawrence Earlbaum Associates.

Also of value to teachers is the following reference file for classroom use:

Building auditory and visual perceptual skills. Wisbech, Cambridgeshire: Learning Development Aids (LDA) (out of print).

That there are at least five children with visually related learning difficulties in each class is from:

Sherman, A. (1973). Relating vision disorders to learning disability. *Journal of the American Optometric Association, 44,* 140-141.

That children who over-converge may show a tendency to move in towards their work is reported by:

Cohen, L.A. (1960). Mechanisms in body balance and coordination. *Connecticut Medicine, 24,* 500-503.

Basic systems used for spelling have been described in:

Forrest, E. (1980). *Visual imagery – an optometric approach.* Santa Anna, Calif.: Optometric Extension Program Foundation.

For further information on the common signs of visualisation see:

Wachs, H., & Furth, H. (1975), see above.

That the correlations between the observations for the checklist of visual signs correlate to identifiable visual dysfunctions is supported by chapter 9 of:

Willows, D., Kruk, R., & Corcos, E. (Eds.). (1993), see above.

Research that children have an optimal working distance is noted by:

Cohen, L.A. (1960), see above.

American Optometric Association (1976). Harmon vision-environment-body mechanics. Their role on learning disability. In T. Greenstein (Ed.), *Vision and learning disability: Proceedings of conference on vision and learning disabilities.* St Louis: American Optometric Association.

A fuller analysis of the current situation regarding Scotopic Sensitivity Syndrome can be found in:

Willows, D. et al (1993), see above.

The author's research into the benefit of aids such as coloured overlays or spectacles is reported in:

Tyrell, R., Holland, K., Dennis, D., & Wilkins, A. (1995). Coloured overlays, visual discomfort, visual search and classroom reading. *Journal of Research in Reading, 18* (1), 10-23.

That vision therapy can be of considerable benefit to many children suffering from visually related learning difficulties is reported in:

The efficacy of optometric vision therapy: A report of the Future of Visual Development Task Force. In a special review issue of: *Journal of the American Optometric Association, 59,* 95-105.

Recent research into the value of the techniques such as pattern-copying are reported in:

Rosner, J. (1986). Management of perceptual skills disorders in a primary care practice. *Journal of the American Optometric Association, 57,* 56-59.

Activities that can be safely carried out by teachers are fully explained in:

Solan, H.A., & Groffman, S. (1982). Understanding and treating developmental and perceptual motor disabilities. In H.A. Solan (Ed.), *The treatment and management of children with learning disabilities.* Springfield, Ill.: C.S. Thomas.

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14

HIT OR MISS

Book buying in school libraries

DENISE DIREEN *Story Power, Christchurch*

The process of book selection in schools may be product driven or market driven. It is product driven when a publishing firm has the major input into book selection. This happens when the publisher's "book rep" presents books to the school for purchase. The choice for teachers is only whether or not to purchase.

On the other hand market driven book selection occurs when a teacher/librarian decides what material is needed and demands of the book seller the type of material desired. The book seller then sources appropriate material for the teacher to choose from. It is the researcher's contention that selections which are market driven will be made from a wider number of books to the benefit of the school library.

In setting up a service to help teachers responsible for primary school libraries to select material to suit the particular needs of their school, the researcher found that the process of book selection in schools appeared to be essentially product driven. Teachers seemed to have relied almost entirely on book reps for advice when purchasing and book buying was sometimes unplanned, undocumented, or even haphazard. Perusal of school libraries' data bases or catalogues revealed that key authors and books were often missing and a variety of genres was not always evident.

Although school book buyers were enthusiastic and eager to improve their book stock, the researcher was also surprised to find that the majority held no children's literature qualifications. The researcher noted that when teachers were assisted with planning and had the time to absorb information about books and authors this resulted in more confident and considered book purchasing.

These impressions led the researcher to consider a wider research study of the factors governing book selection and purchase for primary school libraries and the following research questions were investigated:

Do New Zealand primary school teachers with library responsibility have the time, skills and available product to select books which meet the needs of pupils and staff?

- What resources do teachers use for book selection?
- Do teachers with library responsibility have non-contact time [time away from students] for book study and perusal?
- What children's literature qualifications do teachers hold?
- Are teachers confident about selecting books for the library?
- Do teachers have a written plan for library book purchase?
- What library science qualifications do teachers hold?

METHOD

From 16 primary schools chosen at random within the urban area of Christchurch school, interviews were held with the teacher with responsibility for the library, book selection and purchase.

Interviews were scheduled to suit the teachers concerned and were conducted at lunch time, during school hours or after school. The average time for each interview was 30 minutes, the shortest being 15 minutes and the longest 45 minutes.

Of the 16 respondents, 15 were female and one was male. The age range was between 20 and 60 years. Respondents taught at all levels in the school. From the sample of 16 respondents, two were principals (one non teaching), three were deputy principals (all teaching), two were senior teachers, five were class teachers, one was a reading recovery teacher/class teacher and one was a long term relieving class teacher. Two respondents were not trained teachers but teachers' aides with library responsibility. Of these two teachers aides, one was a trained librarian holding the New Zealand Library Certificate. All respondents were Europeans.

The questionnaire was designed to cover all facets of book buying for school libraries. Respondents were free to comment at any stage throughout the interview and comments were recorded. Raw data was then collated on a spreadsheet for data analysis. The areas of book buying plans, respondent's qualifications, non-contact time, and reasons for book selection and teacher's confidence were targeted as areas for analysis.

DATA ANALYSIS AND DISCUSSION

TEACHER QUALIFICATIONS IN CHILDREN'S LITERATURE

By far the greater number of teachers held no qualifications – see Figure 1 for the proportion of respondents who held specific qualifications in children's literature.

NON-CONTACT TIME ALLOCATED LIBRARY RESPONSIBILITY PER WEEK

Only six of the 16 respondents (including one non-teaching principal) received any non-contact time for library responsibility, see Figure 2. Of the teachers who received non-contact time two received one hour per week with a maximum of four hours per week allocated to one of the respondents. Some of the non-contact time was available to Form 1 and 2 (Year 7 and 8) teachers while their class attended manual training. In one instance, library responsibility was allocated to a teacher who had time available while the class attended manual training for three hours weekly.

USE OF A BUYING PLAN

Just over half of the sample surveyed used a buying plan for book selection, see Figure 3. Documented plans ranged from long term (three-five years) to short term (one year), from several pages of detail through to half-page reports. Some of the respondents who did not use a documented buying plan had mentioned that they had "thought about their purchasing for the year but had not recorded the details".

BOOK SELECTION AIDS

Networking with other schools was the most popular aid to book selection and was used by one-third of the teachers. This networking arrangement was actioned through cluster groups set up and staffed by librarians from the National Library. Cluster groups met once a term but they did not deal exclusively with book selection. All aspects of librarianship were covered at cluster group meetings but the researcher was able to ascertain from the National Library advisers that book selection would be the main thrust usually of one meeting per year. Only two of teachers subscribed to a magazine or booklet that reviewed children's literature – both quoted *Jabberwocky* as the magazine used. This magazine reviews some children's books but it is not regarded as a reviewing journal for teachers – it is intended primarily for children.

Two of the 16 respondents belonged to a children's literature group, Children and Young People in Schools (CHYPS), which operates under the umbrella of the public library. Neither of them attended the meetings (approximately four per year) but used a list of the books that were discussed at the meetings to assist them with book selection. Three respondents had belonged to groups in the past. Figure 4 shows book selection aids used by teachers.

MOST USEFUL RESOURCE FOR BOOK SELECTION

The National Library was chosen by just over one-third of the respondents as the most useful book selection aid. Other resources mentioned were: Rosemary Sladen, a former National Library School Adviser and former manager of a large children's book shop, considered an expert on children's literature; visiting retail stores to examine current material; and book reps – see Figure 5.

TEACHER CONFIDENCE FOR BOOK SELECTION

All teachers felt "good" or "very good" about choosing picture books or beginner fiction. Most teachers felt "good" or "very good" about choosing younger fiction or art and craft books. The areas which caused concern for some of the teachers included: science; fiction for older children (reasons included concern about possible sexual references and coarse language, and not having enough time to read the books properly before purchase); books about other countries; poetry and biographies; myths, tales and legends (one reason given was that a respondent did not feel "up to date with new material available"); technology (one respondent mentioned that help would be enlisted: "ask someone on the staff who held a specialist interest in that area for assistance").

LITERATURE REVIEW

A review of relevant literature confirmed the study's findings regarding libraries in New Zealand primary schools.

Munn and Barr (1934), Osborn (1960), Fenwick (1975), and Chalmers and Slyfield (1993) in their research reports found that all was not well in school libraries. Comments made in their research indicated that teachers lacked the time, skills, book knowledge, and

FIGURE 1: TEACHER QUALIFICATIONS IN CHILDREN'S LITERATURE

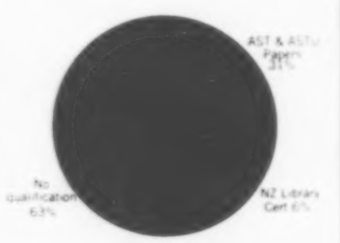


FIGURE 2: NON-CONTACT TIME ALLOCATED FOR LIBRARY RESPONSIBILITY PER WEEK

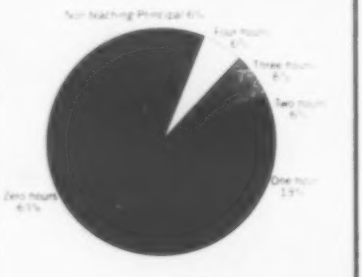
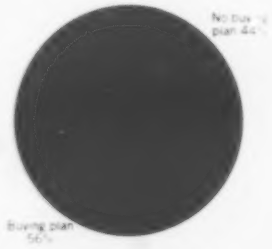


FIGURE 3: USE OF BUYING PLAN



qualifications to select books for their libraries in a professional manner. It would seem that not much has changed in 1995.

Teachers' knowledge of children's books was a key factor associated with the planning and purchase of school library book stock. Cook (1981) referred to this when he stated that it was important for a school librarian to know their book stock and read widely. McKenzie (1994) held strong views on the importance of teachers being familiar with children's books too. He noted some cause for concern, when he stated:

> It is entirely possible (and fairly common) to have teachers who are knowledgeable about effective learning strategies and are able to implement them appropriately and produce readers who can read, but readers choose not to because the teachers are not knowledgeable about the range, quality and content of books for children.

In an interview with the researcher Rosemary Sladen also acknowledged the importance of teacher's book knowledge. Her experience with book supply to schools and her extensive contact with teachers who were buying for their school libraries led her to come to a depressing conclusion. She felt that when it came to promoting children's literature, there were too many teachers who knew too few books.

The issue of available time was another area of importance that was considered by several researchers. Chalmers and Slyfield found that teacher release hours were found to be unsatisfactory by 77 percent of the school principals they interviewed (the figure may have been different if they had interviewed the teachers with library responsibility as well). Fenwick also acknowledged that the process of book study and selection was a time consuming process.

In late 1993 the first of the students from the Diploma of Teacher Librarianship, a distance course from the Auckland College of Education, graduated. Release time for these new graduates was a problem to be grappled with. Gwen Gawith, the course convenor, canvassed the schools who employed them. She justified the importance of release time to the principals of these schools. Clearly it was now the school's responsibility and not the government's decision to budget for release time for these new teacher-librarians. Some of the more wealthy schools were able to give up to .5 release time for their graduate teacher librarians. Most schools were only able to offer a few hours per week. The question the researcher therefore has had to ask is, "Do we yet have staff with the time and the training to effectively choose books for primary school libraries?"

DISCUSSION AND CONCLUSIONS

Available time to manage a school library is a critical area. Since most of the respondents received no non-contact time then there must be precious little time in a busy class teacher's week to study, plan for, read, and evaluate new titles. Some respondents from the smaller schools were also required to catalogue, mend, strengthen, and shelve books when no teacher aide hours were available for the library. The compilation of a selection file, familiarity with present book stock, regular weeding, perusal of book reviews, attendance at a children's literature group, constant viewing and reading of new books, attendance at cluster groups, consultation with fellow teachers, and detailed planning may not always be practical options for a classroom teacher if non-contact time is unavailable.

The researcher was not surprised to find that only half of the respondents with library responsibility were using a buying plan. Lack of planning must be of concern as it indicates that the buying of library books is not always undertaken in a methodical and professional way. The school library budget is often topped up by the Parent Teacher Association (PTA). How is spending accounted for? Do school boards and PTA's presume that the money has been spent carefully by not only enthusiastic staff but staff who have planned and studied prior to making selections?

Few respondents had any specialist qualifications for book selection. Skills gained from detailed study of specific areas of children's literature are invaluable tools for book selection. Specialised study means familiarity with authors and books. Students of children's literature are required to read widely in their areas of study, across age groups and genres. Titles and authors are critically evaluated. Comparisons of similar areas enables evaluations to be made.

If most teachers did not have extra time available nor held special skills for book selection then the researcher presumed that some resources available to teachers might help considerably with book choice. Resources used as aids for book selection by respondents were varied. Respondents were asked to nominate their most valuable resource for book selection.

While the National Library was cited by over one-third of the respondents as their most useful resource for book selection, its role is changing. School advisers no longer move among a wide range of schools. The emphasis is no longer on producing and circulating book lists for every school, or visiting schools on request to assist with weeding and long and short term planning. This is no longer possible for school advisers since three-quarters of their time is dedicated to the Focus 2000 initiative, a new and exciting strategic plan for school libraries. It is an admirable initiative aimed at leading schools into the twenty-first century so they can cope with the rapid advances in technology and information systems. The board, along with all the teaching staff, plan their book stock to support their particular school. Sadly however this innova[illegible] exciting concept seems to be gear[illegible] for secondary schools. Any school [illegible] to join the focus programme but a[illegible]

FIGURE 4
BOOK SELECTION AIDS

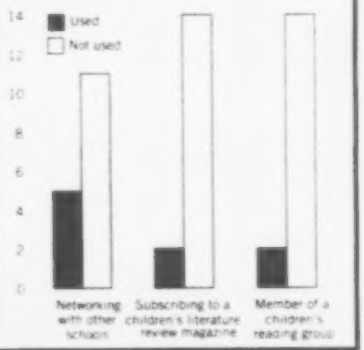
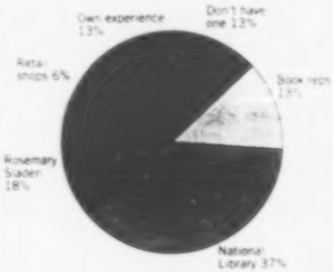


FIGURE 5: MOST USEFUL
RESOURCE FOR BOOK SELECTION



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only accepted if it meets the required criteria. The researcher was not permitted to view these criteria.

In 1995 in the Canterbury area, seven schools (five secondary and two primary) have been accepted for the Focus 2000 programme; in the Dunedin area, six schools (four secondary and two primary) have been accepted; while in the Greymouth area only one school has been accepted and that is a secondary school. The library advisers now spend 75 percent of their time with the few primary schools and the more numerous secondary schools enrolled in Focus 2000. The remaining 25 percent of the library advisers' time will now be spread very thinly among a very large group of primary schools.

With the changing role of the school advisers at National Library and the absence of Rosemary Sladen from the book retailing area, effectively half of the resources found valuable to the sample are no longer available.

It was of concern to find that one-quarter of the respondents found no particular resource useful for book selection. One then needs to ask "Why?" Were respondents using their gut feelings to buy books? How did they become familiar with new authors and new titles? Did these respondents have the skills to do the job single-handed? One would think not when most of the sample had no specialist qualifications in the field of children's literature.

Respondents relying on book reps as their most important resource may be relying on someone who is enthusiastic about the product of only one publishing company, and whose main focus is meeting sales targets, not providing expert advice in the field of choosing books for schools.

Ironically, the majority of respondents still felt confident about selecting books in most areas of the library, despite the fact that the majority of respondents in the research have not made a study of children's literature, have no non-contact time for library work, and do not use available resources.

This researcher found indications that book selection in most of the schools surveyed must be a hit or miss affair.

It would seem there is room to move to a market driven book selection policy, and to raise questions of accountability by Boards of Trustees over purchase and allocation of resources. There is a challenge also for relevant institutions, like Colleges of Education, to meet current teacher needs. There are also opportunities for business entrepreneurs with specialised knowledge in children's literature to develop market driven support systems.

LIMITATIONS OF RESEARCH

This research concentrated on only a small sample of schools, and with hindsight, other questions could have been asked, for instance: was the school library mentioned in the school charter? (thus gauging the importance with which the library was held by the whole school community); did the school have a written policy for library development?; how did respondents find out about new material informally? (for example, *Listener* reviews, informal chatting with fellow teachers, chatting with librarians, and pupils suggestions).

Further study could evaluate each respondent's library collection in key areas of fiction (all levels); poetry, picture books, myths, legends and folk tales, art and craft, biographies, science and technology. This would provide the correlation between the confidence of teacher making selections and the quality of their selection [illegible] useful also to question the [illegible] pupils) of the respondents' [illegible] the library met their needs.

NOTES

DENISE DIREEN, H Dip Tchg, a former primary school teacher, is at present operating a specialist book consultative service for parents, children, teachers and staff from educational institutions. Her special interest in children's literature, developed through her studies for the National Diploma in Children's Literature, has enabled her to establish and operate her own business, Story Power, P O Box 8016, Christchurch, e-mail misc2165@csc.canterbury.ac.nz

For more details of this study, including the procedures used to select those interviewed, see:

Direen, D. (1995). *Book buying in school libraries: Hit or miss?* Unpublished manuscript. Christchurch College of Education, Christchurch, New Zealand.

The situation in Australia is quite different, where library science is emphasised within teacher training programmes and most schools have teacher librarians (not classroom teachers with additional responsibilities for the library).

New Zealand primary school teachers wanting to acquire skills and qualifications in library science or children's literature could consider the following:

- The Focus 2000 programme (National Library of New Zealand, Wellington) designed to give teachers the necessary skills to run a school library. Although this programme has received some criticism in my research I believe that it goes some way to assisting primary schools with the development of their libraries more especially in the area of library science.
- Library Studies Certificate (Wellington College of Education) a two-year part time programme by distance education which provides vocational training in the basics of library tasks.
- Diplomas of Teacher-Librarianship, Information Studies and Information Technology (Auckland College of Education) aimed at teachers and largely delivered by "mediated distance education".
- National Diploma in Children's Literature (Christchurch College of Education) – a four-year part time distance education programme, open to both national and international students.

Teachers can also attend seminars organised by local Reading Associations which cover various aspects of reading and book selection, and be involved with school cluster groups, organised by library advisors from the National Library. At these cluster groups important aspects of library management and book selection are covered. The National Library and the Reading Association support and assist teachers with responsibility for the primary school library in the areas of library science and book selection.

Useful review resources for New Zealand teachers are:

Muirson, B. *Around the bookshops.* Wellington: GP Quickprint Ltd.

Kohia Teacher's Centre. *New and notable.* Auckland: author.

Previous studies of New Zealand school libraries include:

Chalmers, A. & Slyfield, H. (1993). *Contributions to learning: Libraries in New Zealand schools.* (The Report of the National Library Research Project: Libraries, Learning and Teaching in New Zealand Schools). Wellington: Research Unit, National Library of New Zealand.

Fenwick, S. (1975). *Library services for children in New Zealand schools and public libraries. A report to the New Zealand Library Association.* (Studies in Education No. 24). Wellington: New Zealand Council for Educational Research and New Zealand Library Association.

Munn, R. & Barr, J. (1934). *New Zealand libraries: A Survey of conditions and suggestions for their improvements.* Christchurch: Libraries Association of New Zealand.

Osborn, A. (1960). *New Zealand library resources: Report of a survey made for the New Zealand Library Association.* Wellington: New Zealand Library Association.

Planned book buying is discussed in:

Cook, J. (1981). *School librarianship.* Sydney: Pergamon Press, 1981.

National Library of New Zealand, School Library Service (1984). *Manual for school libraries.* Wellington: author.

Sladen, R. (1995, February). Rousing the reader: Handy hints for buying books. *Good Teacher.*

The importance of teachers being familiar with children's books is noted by:

Cook (1981): see above.

McKenzie, J. (1990, May). Teachers as readers: An endangered species? *Eduvac.*

For details on The Focus 2000 initiative see:

National Library of New Zealand (1995, Term One). *School Libraries 2000 Programme Newsletter.* Wellington: author.

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